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DEMON — A PROGRAMME GENERATOR FOR PROBLEMS INVOLVING ORDINARY DIFFERENTIAL EQUATIONS

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ABSTRACT

DEMON is a system designed to solve problems involving ordinary differential equations as quickly as possible. It accepts differential equations in the D–notation (that is, $y'' = y + y'$ is expressed as D2Y = Y + DY), and generates a FORTRAN programme to solve the problem. A means is provided for solving boundary equation problems. New integration methods may be defined to DEMON together with the problem. These methods may range from Predictor – Corrector to Gaussian quadrature. Non–self–starting methods are automatically started.

The DEMON programme has been written in COBOL and should be suitable for any large machine. At the A.A.E.C. Research Establishment the DEMON system is working on a 32K IBM – 7040, where the time taken from completely defining the problem to receiving the results may be as short as ten minutes.

CONTENTS

1. INTRODUCTION

This report describes a programme generator, DEMON, which has been designed to solve problems involving ordinary differential equations as quickly as possible. The differential equations are represented in the D – notation. For example,

$$y' = z$$

$$z'' = -y + z'$$

would be expressed as

```
DY = Z
D2Z = -Y + DZ
```

DEMON accepts a minimal definition of a problem then generates a FORTRAN programme to solve it. Since the major part of the FORTRAN programming is done on the computer, the overall time taken to solve problems is only a fraction of the time required by normal methods.

The user can cause a search to be made for points which are of interest to him. Properties may be forced onto the mathematical system, by an iterative method which requires estimates of all the unknown parameters; improvements are then made to these estimates. DEMON will accept any point of interest, or property, which can be described. Boundary value problems fall naturally into this scheme; so do nonlinear simultaneous equations.

Step–by–step integration methods, ranging from Predictor – Corrector to Gaussian quadrature, may be defined to DEMON with the problem.

The DEMON programme generator has been written in COBOL (IBM 1964a), so the DEMON system should prove useful to any installation having both FORTRAN and COBOL compilers.

2. THE DEMON SOURCE PROGRAMME

Programmes for use with DEMON (hereafter called the user's programme) are based largely on the FORTRAN language. A very general skeleton programme has been written in FORTRAN. This contains many sections such as the integration of differential equations, the solution of boundary value problems, and the searching for points of interest. When the user's programme is read, parts of the skeleton programme are selected, altered, or manufactured, to form a complete FORTRAN programme which can solve the problem.

The user's programme consists of four parts, which are separated by three cards:

```
ENTER DEMON
FUNCTION
END DEMON
```

The parts are as follows:

Part 1 This part of the programme is written in FORTRAN. It is required to assign the initial values, and the step length, for the integration.

Part 2 Those statements which are not contained in the FORTRAN language (apart from differential equations) belong in Part 2.(See Appendix 2). This part is used to describe points of interest and boundary equations; it is also used to vary the generated programme.

Part 3 The mathematical system to be solved is described in this part.

Part 4 This part is entered when the problem has been solved. It is also written in FORTRAN.

The generated FORTRAN programme contains statements supplied by the user and by the skeleton programme. To eliminate confusion between these two sources, some variable names and statement numbers should be avoided. A list of these is given in Appendix 1.

3. THE MATHEMATICAL SYSTEM

The mathematical system is described in FORTRAN, except for the differential equations. These are written using the D-notation and should be set out with the highest differential forming the left hand side. For example,

$$a = 1.5 + y * z'$$

$$y' = z + \sin(a)$$

$$z'' = -y + z'$$

would be written

```
A = 1.5 + Y * DZ
DY = Z + SIN (A)
D2Z = -Y + DZ
```

The D-notation may be used to refer to derivatives anywhere else within the system. Any number of differential equations may be used and they may be up to the ninety-ninth order.

The statement

```
DT = 1.
```

is always implied to be the first differential equation.

All the variables occurring on the left hand side of arithmetic statements will be termed "supplementary" variables. The variables implicitly defined by the differential equations will be termed "basic' variables. In the example above the basic variables are T, Y, Z, and DZ. The supplementary variables are DT, A, DY, and D2Z.

4. NOMINATED POINTS

A search may be made for points of interest. The point where y is zero is written

```
(Y = 0.0)
```

Such a definition will be termed a "condition". It has the general form

$$(F_1 = F_2) \text{ or } (F_1 = F_2, J)$$

where the second form represents a condition which is satisfied only after several encounters. For example, the third zero of y would be

```
(Y = 0.0, 3)
```

The functions F_1 and F_2 may contain either basic or supplementary variables, or both. At least one variable should be used, since otherwise the difference $F_1 - F_2$ would not vary and hence would never be zero.

The conditions described above could further be termed "essential conditions". A second type of condition, a non-essential condition, has the form

$$N(F_1 = F_2) \quad \text{or} \quad N(F_1 = F_2, J)$$

The non-essential condition is valuable when looking for a point which may not exist within the desired range.

The integration will proceed until all the essential conditions have been satisfied. Therefore at least one essential condition must be used to indicate the range of the integration. Output is given when a condition is satisfied.

Conditions are also used in solving boundary equations. The condition card is used in Part 2 of the user's programme.

5. A COMPLETE USER'S PROGRAMME

The integration of Bessel's differential equation up to the second zero will be used as an example of DE!ION. The differential equation is

$$y'' + y'/t + y = o \quad .$$

The first part of the programme has to define the initial values and the step length. The step length is always given the name STEP.

Part 1 is

```
T = 0.0
Y = 1.0
DY = 0.0
STEP = .25
```

The condition

```
(Y = 0.0, 2)
```

is used to indicate the range of the integration. In this instance it is the only card in Part 2.

The differential equation must be used in the form

```
D2Y = -(DY/T + Y)
```

Since the second differential cannot be evaluated at T = 0.0 the following statements have to be used in Part 3:

```
      IF (T) 1, 2, 1
2     D2Y = -1.
      GO TO 3
1     D2Y = -(DY/T + Y)
3     CONTINUE
```

The programme entered after the integration is completed (Part 4) will be :

```
      CALL EXIT
      END
```

The complete programme will be :

```
      T = 0.0
      Y = 1.0
      DY = 0.0
      STEP = .25
      ENTER DEMON
      (Y = 0.0, 2)
      FUNCTION
      IF (T) 1, 2, 1
2     D2Y = -1
      GO TO 3
1     D2Y = -(DY/T + Y)
3     CONTINUE
      END DEMON
      CALL EXIT
      END
```

The output for this programme will consist of T, Y, and DY at each integration step and at the last point. A listing of the generated programme and the output is given in Appendix 3.

6. BOUNDARY EQUATIONS

DEMON contains an algorithm to attempt to force required properties upon the mathematical system. Suppose y is required to be 50 when x is 100. This is expressed

```
Y (X = 100.) = 50.
```

DEMON may be used to solve many boundary equations. To satisfy each, there must be a degree of freedom in the ma hematical system. This will norma ly be one of the initial values, but may be any variable which affects the mathematical system. The card

```
ALTER (DY)
```

indicates that the initial va ue DY is to be used as a degree of freedom.

The method used to satisfy the boundary equations is a variation of Newton's method. For this method an estimate is needed for each of the "alterable" parameters, say A and B. The system is integrated and the discrepancies, say U and V, in the boundary equations found.

A small change, δA, is then made to A and the discrepancies evaluated once more. $\frac{\partial U}{\partial A}$ and $\frac{\partial V}{\partial A}$ can then be est mated from the changes in U and V. Similarly $\frac{\partial U}{\partial B}$ and $\frac{\partial V}{\partial B}$ can be estimated.

A linear equation giving the first order corrections to A and B can be set up:

$$\frac{\partial U}{\partial A}\ \delta A + \frac{\partial U}{\partial B}\ \delta B + U = 0.$$

$$\frac{\partial V}{\partial A}\ \delta A + \frac{\partial V}{\partial B}\ \delta B + V = 0.$$

The equation is solved for δA and δB, the corrections made, and the cycle repeated.

The user must specify how much the alterable parameter is to be changed when estimating the variations. This information should appear on the ALTER card. For example

ALTER (DY), 0.1

indicates that DY should be changed by 0.1

Two methods are available to halt the iteration:

(i) A tolerance may be assigned to a boundary equation. For example,

Y (X = 100.) = 50., .001

is used to indicate

Y (X = 100.) = 50. ± .001

(ii) A limit may be given for the number of iterations, for example:

ITERATE (6)

Combinations of tolerances and iteration limit can be used, as follows:

(i) If both tolerances and an iteration limit are used, the iteration will cease when either has been satisfied.

(ii) If only tolerances are used, the iteration will continue until they are satisfied.

(iii) If only an iteration limit is used the iteration will be done that many times.

(iv) If neither a tolerance nor an iteration limit is used, one iteration will be made.

A relaxation coefficient may be introduced. The card

RELAX (.1)

indicates that only one tenth of the estimated correction should be used.

7. A USER'S PROGRAMME INVOLVING BOUNDARY EQUATIONS

This example is a ballistics problem. A shell is required to reach a maximum height of 50 feet at a distance of 100 feet. These requirements are

Y (X = 100.) = 50.

DY (X = 100.) = 0.0

The parameters used to satisfy these boundary equations are the vertical and horizontal components of the initial velocity. This is expressed

ALTER (DY)

ALTER (DX)

The differential equations governing the flight contain air resistance terms. These are

```
D2Y = -32.2 - .01 * ABS (DY) * DY
D2X = - .01 * ABS (DX) * DX
```

Part 1 specifies the initial values and the step length.

```
T = 0.0
Y = 0.0
X = 0.0
DY = 100.0
DX = 100.0
STEP = 1./128.
```

Part 2 specifies the boundary equations (with tolerances), the alterable variables (with alterations), and an iteration limit.

```
Y (X = 100.) = 50., .001
DY (X = 100.) = 0.0, .00001
ALTER (DY), .1
ALTER (DX), .1
ITERATE (6)
```

It is not necessary to use a condition to define the range of integration in this case since the boundary equations imply the condition (X = 100.).

Part 3 consists of the differential equations given above.

Part 4 is the programme entered when the problem has been solved. This is

```
CALL EXIT
END
```

A listing of the generated programme and the results are given in Appendix 3.

8. SUBSCRIPTED DIFFERENTIAL EQUATIONS

Consider the heat conduction equation in one dimension,

$$\frac{\partial f}{\partial t} = \alpha \frac{\partial^2 f}{\partial x^2} \quad , \qquad (1)$$

where t is time, x is the space dimension, α is the heat conduction coefficient, and f is the temperature. One may use the approximation

$$\left(\frac{\partial^2 f}{\partial x^2}\right)_i = \frac{f_{i+1} - 2 f_i + f_{i-1}}{\delta x^2} \quad , \qquad (2)$$

where the x_i are points at regular intervals δx, and f_i is the temperature at x_i.

Consider a bar of metal which is divided into 4 segments giving 5 points. The approximation

results in 3 differential equations :

$$\frac{df_i}{dt} = \alpha \left(\frac{f_{i+1} - 2f_i + f_{i-1}}{\delta x^2} \right) \quad i = 2, 4 \qquad (3)$$

The end points x_1 and x_5 require special consideration since there are no points x_0 and x_6. Suppose the end point x_1 is held at constant temperature, while the end point x_5 could be radiating heat. These boundary conditions are :

$$\frac{df_1}{dt} = 0.0 \qquad (4)$$

$$\frac{df_5}{dx} = -h\ (f_5 - f_g) \quad , \qquad (5)$$

where h is the coefficient of heat transfer and f_g is the temperature of the surroundings. Equation 5 can be used to eliminate f_6 from Equation 2. From (5)

$$\frac{f_6 - f_4}{2\,\delta x} = -h\ (f_5 - f_g) \quad , \qquad (6)$$

giving

$$f_6 = f_4 - 2.\,\delta x.\,h\ (f_5 - f_g) \qquad (7)$$

$$\frac{df_5}{dt} = \alpha\ \frac{(f_6 - 2f_5 + f_4)}{\delta x^2} \qquad (8)$$

This system can be expressed to DEMON as follows :

```
      DIMENSION  F(5)
      DF(1) = 0.0
      DO 1 I = 2,4
    1 DF(I) = ALPHA *(F(I+1) - 2.* F(I) + F(I-1)) / DELX ** 2
      FSIX = F(4) - 2.* DELX * H* (F(5) - FG)
      DF(5) = ALPHA * (FSIX - 2.* F(5) +F(4)) /DELX ** 2
```

The DIMENSION statement is necessary for the DEMON generator to calculate the number of differential equations. Subscripted differential equations may be up to the ninety ninth order, and up to nine subscripts may be used. Subscripted and normal differential equations may be freely mixed.

A programme using the equations above is given in Appendix 3. In practice, the number of points would be much greater, making the finite difference approximations more accurate.

9. THE INDEPENDENT VARIABLE

The implicit differential equation is normally

```
DT = 1.
```

The card

```
IMPLICIT (TIME)
```

changes the implicit differential equation to

```
DTIME = 1.
```

It is possible to select any of the basic variables as the independent variable. In the system

$$DX = 1.$$

$$DY = F(X, Y)$$

the independent variable is X. If the derivatives are continually normalised so that DY = 1., then Y will become the independent variable. This gives the same effect as the statements

$$DX = 1./F(X, Y)$$

$$DY = 1.$$

The user may nominate the independent variable, by using the card:

INDEPENDENT (Y)

Normally the implicit differential equation supplies the independent variable.

The method of finding zeros of conditions (Wheeler 1959) may also involve a change in independent variable. For the equation

$$DY = F(Y)$$

and a condition

$$(Y = 10.)$$

the following procedure is used.

(i) The integration proceeds until a zero of the condition is found between two successive steps. Suppose the values of Y at these points are Y_1 and Y_2 .

(ii) The independent variable is changed to Y and the step length changed to $-(Y_1 - 10.)$.

(iii) A single step is taken from Y_1 which brings Y to 10.

This procedure is automatic, but is used only when the condition has the form

$$(F_1 = F_2)$$

where F_1 is a basic variable and F_2 is a function not involving either the basic or supplementary variables.

Where the condition is not of this form, the point is found by linear interpolation in the independent variable, followed by an integration step from Y_1.

10. OUTPUT FROM THE GENERATED PROGRAMME

The output from the generated FORTRAN programme is, as far as possible, self-explanatory. FORMAT statements are generated from the differential equations, conditions, boundary equations, and ALTER cards. Many examples of these FORMAT statements may be found in the sample programmes in Appendix 3.

10.1 Form of the Output

Output statements are usually specified by an OUTPUT card, for example :

OUTPUT (WRITE (6,*)) (WRITE (0))

An asterisk specifies that a FORMAT statement should be generated and that the asterisk should be replaced by the statement number. A list of arguments will be added in the usual way.

An output statement without an asterisk is taken as a binary output statement. The list of arguments will comprise the basic and supplementary variables.

The standard OUTPUT statement used at Lucas Heights is

OUTPUT (WRITE (6,*))

which is inserted by the DEMON generator if no OUTPUT statement is included.

The width of the output can be limited. For example, the card

CPL (80)

would ensure that none of the FORMAT statements generated would cause output of width greater than 80 characters. The standard card inserted by the DEMON generator in the absence of any CPL card s

CPL (132)

10.2 Frequency of Output

Regular output is normally given after each integration step. A FREQUENCY card can be used to vary this in either of two ways.

(i) A FREQUENCY card with a fixed point argument signifies that output is to be given after that number of integration steps. For example

FREQUENCY (100)

will cause output after every 100 integration steps.

(ii) A FREQUENCY card with a floating point argument will cause output to be given at intervals of the independent variable. For example

FREQUENCY (1.)

will cause output to be given every unit interval.

When a fixed point FREQUENCY card is used, changes in the step length will cause irregularities in the output. However output with a floating point FREQUENCY will be unaffected when the step length is changed.

10.3 The Output Variables

The output normally given is the basic variables. However, the list of variables for use with alphameric output statements may be nominated by the user.

The card

BASIC, T, Y

is used to give T and Y only.

The card

ALL SUPPLEMENTARY

will cause all the supplementary variables, as well as the basic variables, to be given as output.

The card

SUPPLEMENTARY, DY, A

will cause the nominated variables to be given, as well as the basic variables.

10.4 The Condition's FORMAT

For the condition

(Y = 20.)

a FORMAT statement

FORMAT (12H ES (Y = 20.))

is manufactured. When the condition is satisfied, alphameric output using this FORMAT will be given, followed by the output for that particular point.

For the condition

N (Y = 20.)

the FORMAT statement uses the symbol NE rather than ES. For the condition implied in the boundary equation

Y (X = 100.) = 50

the symbol is AT.

10.5 Output for Boundary Equation Problems

At the start of a main run, during the solution of a boundary equation problem, the values of the alterable parameters are given. A FORMAT statement is generated from the ALTER statements. An example of this can be found in the generated programme to solve the ballistics problem (Appendix 3).

After the main run has finished, the discrepancies in the boundary equations are given. The first discrepancy corresponds to the first boundary equation, and so on.

All the above output is given as alphameric output.

10.6 Temporary Output for Boundary Equation Problems

During the iterations the normal output from each main run is stored on some binary device. This can be nominated by a FILE card. The normal FILE card used at Lucas Heights is

FILE (REWIND O) (READ (O)) (WRITE (O))

which is inserted by the DEMON generator if no FILE card is given. Three arguments must be used. The first should be a repositioning statement, which will be used intact. The second and third statements should be a READ statement and a WRITE statement respectively. These will have a list attached, consisting of the basic and supplementary variables.

11. USE OF OTHER INTEGRATION METHODS

The step-by-step solution of the differential equations

$$t' = 1$$

$$z' = f(t, z)$$

consists of finding z at time t_{n+1} (hereafter called z_{n+1}) from z at t_n (that is, z_n). The times t_n and t_{n+1} are related by

$$t_{n+1} = t_n + \text{STEP}$$

where STEP is the step length for the integration.

The equation

$$y' = f(y)$$

will be used to represent one of a general set of differential equations. The usual procedure for solving such an equation is :

(i) Compute y'_n from y_n

(ii) Compute y_{n+1} from y_n and y'_n

} (A)

or, alternatively :

(i) Compute y_{n+1} from y_n and y'_n

(ii) Compute y'_{n+1} from y_{n+1}

} (B)

The procedures (A) and (B) are identical except for a "phase shift". After a step, the information available from (A) is y'_n and y_{n+1}, whereas the information from (B) is y_{n+1} and y'_{n+1}. In procedure (B) all the information relevant to the point y_{n+1} becomes available at the same time. Because of this, all integration methods for use with DEMON must be of form (B).

The use of a particular integration method in the generated programme can be specified by a card. For example

USE (RK2)

indicates that the method with name (RK2) should be included.

Two USE cards may be included and may nominate a self-starting method and a non-self-starting method. The generated programme will use the self-starting method to find sufficient starting values for the non-self-starting method. The self-starting method will also be used to find the zero of a condition. If no USE card and its corresponding method definition are given, the standard integration method contained in DEMON will be used.

Normally several differential equations would be solved, the number of equations being stored in NDE. In the following, NK is a dummy variable whose range is from 1 to NDE.

In the generated programme four vectors are used to hold y_n, y'_n, y_{n+1}, and y'_{n+1}. These are OY(NK, N1), OY(NK, NF1), OY(NK, N2), and OY(NK, NF2) respectively. At the start of the

integration, the initial values are stored in OY (NK, N2). From these the derivatives at the initial point can be calculated, giving all the information required for a step in procedure (B).

The technique of defining new methods is based largely on the FORTRAN language. All FORTRAN statements are allowed, while some new statements have been introduced. Because the method will eventually be part of a FORTRAN programme, the following fixed point variable names and statement numbers should be used.

1. Self-starting methods
   M ; 4800 to 4899

2. Non-self-starting methods
   L ; 4900 to 4999

The extra statements are :

METHOD (RK2)	This gives the method a name. It should be the first card of the description.
OY (NK, NF2) = FUNCTION (OY (NK, N2))	The derivative of OY (NK, N2) will be calculated and placed in OY (NK, NF2).
LOOP	The cards before LOOP may be used to initialise the integration. The cards between LOOP and END describes the inner integration loop.
ALLOT (MP1)	This card causes a vector to become available and may be referred to as OY (NK, MP1).
RESTORE (MP1)	This card is the converse of ALLOT. The vector OY (NK, MP1), now no longer needed, will be returned.
ROTATE (N1, N2)	This card causes an apparent rotation of the information in OY (NK, N1) and OY (NK, N2). In reality the information in N1 and N2 is rotated, rather than that in the vectors.
END	This card concludes the definition of the integration method.

For self-starting methods, the first statement after LOOP should be a ROTATE statement having a statement number 4800. The statement following this should have a statement number 4801.

The second order Runge Kutta method (Lance 1960, p.52), a typical self-starting method, is used as a standard method in DEMON. A description is given in Appendix 4.

Two further cards are necessary to describe non-self-starting methods.

CALCULATE (N1, NF1, N2, NF2)	This card causes linkage to the self-starting method to be created. OY(NK, N2) and OY(NK, NF2) will be calculated from OY(NK, N1) and OY(NK, NF1). No rotations will be performed.
EXAMINE	This card should be used after new values of OY(NK, N2) and OY(NK, NF2) occur during the preliminary phase of a non-self-starting method.

A typical non-self-starting method, the second order predictor corrector method (National Physical Laboratory 1961, p.83), is described in Appendix 4. For non-self-starting methods, the first statement after LOOP should have a statement number of 4900.

The step length may be changed during the integration. The method of Merson's Runge Kutta (Lance 1960, p.56) is used to illustrate this, and a listing is provided in Appendix 4. If the variable NV, which occurs in the generated programme, is non-zero, the method is being used to find the zero of a condition with a reduced step length. Under these conditions the step length should not be changed.

Gaussian integration (Lance 1960, p.145; U.S. N.B.S. 1954, p.187) may also be described to DEMON. A fifth order scheme is given in Appendix 4.

12. OTHER USES OF DEMON

DEMON may be used for a number of problems other than those already discussed.

12.1 Quadrature

The integral

$$\int_A^B F(T)\,DT$$

may be evaluated by the programme

```
T = A
Y = 0.
STEP = .01 (say)
ENTER DEMON
(T = B)
FUNCTION
DY = F(T)
END DEMON
CALL EXIT
END
```

The Gaussian integration scheme given in Appendix 4 could also be used here.

12.2 Solution of Linear Equations

The equations

$$x + y = 3$$

$$x - y = 1$$

may be solved by the programme

```
T = 0.0
X = 0.0
Y = 0.0
STEP = 1.
ENTER DEMON
ALTER (X), .1
ALTER (Y), .1
R (T = 0.0) = 3.
P (T = 0.0) = 1.
ITERATE (2)
FUNCTION
R = X + Y
P = X - Y
END DEMON
CALL EXIT
END
```

Both the above problems may be attempted with confidence. The next two are given as an example of the problems which may be tackled with DEMON. Because of the inherent numerical difficulties, the solution to these types of problem cannot be guaranteed.

12.3 Solution of Nonlinear Simultaneous Equations

Nonlinear simultaneous equations can be solved in a similar fashion to the linear equations. The problem

$$xy = .25$$

$$(x-1)^2 + y^2 = 1.$$

may be solved by the following programme

```
T = 0.0
X = 1.
Y = 1.
STEP = 1.
ENTER DEMON
R (T = 0.0) = 0.0, .0001
P (T = 0.0) = 0.0, .0001
ALTER (X), .0001
ALTER (Y), .0001
```

```
ITERATE (100)
RELAX (EXP (-(ABS(ON(1)) + ABS(ON(2)))))
FUNCTION
R = (X-1.)**2 + Y**2 - 1.
P = X*Y - .25
END DEMON
CALL EXIT
END
```

This programme and the results are given in Appendix 3. The RELAX card has been used to accelerate the convergence. At the end of a main run the discrepancies in R and P are stored in ON(1) and ON(2). Where these discrepancies are large a small relaxation coefficient is taken. As the discrepancies decrease, and X and Y are closer to the solution, the relaxation coefficient approaches one.

12.4 Minimisation of a Function

Minimisation of a function requires a property which attains a known value at the desired point. Such a property could be $F(x+\delta x) - F(x-\delta x)$, which is zero at a minimum and a maximum.

The programme might be

```
T = 0.0
X = A
STEP = 1.
ENTER DEMON
ALTER (X), .01
R(T = 0.0) = 0.0, .00001
RELAX (.1)
FUNCTION
R = F(X + .001) - F(X - .001)
END DEMON
CALL EXIT
END
```

A small constant value has been used for the relaxation coefficient in this case.

13. DEMON AND THE IBM IBSYS MONITOR

DEMON has been incorporated into the IBM IBSYS monitor system (IBM 1963, 1964b, 1964c) so that a problem may be solved by DEMON in one job on the computer. The process may be divided into 5 parts.

(i) The DEMON generator is called off the library tape.

(ii) The user's programme is read and the generated FORTRAN programme is written onto Utility tape 4.

(iii) The input and Utility tape 4 are switched.

(iv) The FORTRAN programme on Utility tape 4 is compiled and executed.

(v) The original configuration is restored.

A complete set of control cards is given with the listing of the first user's programme in Appendix 3. The generated FORTRAN programme may also be punched or printed as it is produced. These options should be indicated on the ENTER DEMON card. For example

ENTER DEMON, DECK, LIST

gives both a card deck and a listing.

14. CONCLUSION

It has been shown how DEMON may be used to solve problems in ordinary differential equations with either initial values or boundary equations. This is intended to be the main use of the programme However it has been shown that DEMON may be used to solve other problems as well.

The technique of defining new integration methods should benefit the person who wishes to use more sophisticated integration methods.

The object of computing results from a complete definition of a problem has been achieved. The user can submit a much smaller programme to the machine, programmes generated by DEMON will not have to be debugged, and the overall time to get answers to problems which are acceptable to DEMON will be much shorter.

15. ACKNOWLEDGEMENTS

The author would like to thank D.E. Elliot, D.J. Richardson, and I.G. Nicholls for their encouragement, and J.P. Pollard for permission to use his SID programme block to solve the linear equations of order three or greater.

16. REFERENCES

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APPENDIX 1

RESTRICTIONS ON SYMBOLS

The user should avoid the following symbols.

1. Floating point variables starting with the letter O.
2. Fixed point variables starting with the letter N.
3. Statement numbers from 4000 to 4999.

If boundary equations are being solved, the following symbols must also be avoided.

1. Variable names containing the name SID.
2. Statement numbers from 8800 to 8899.

If the user is defining his own integration method the restrictions in Section 11 should be noted. The extra symbols used by the standard integration method are MP and MK2.

No check is made on these restrictions in the DEMON generator. It may be useful to refer to these symbols in the generated programme; but normally they should not be used.

APPENDIX 2

CONTROL CARDS WHICH MAY BE USED IN PART 2

The following cards will be recognised when used in Part 2 of the user's programme. All cards except conditions and boundary equations are distinguished by the first three characters, which should start in column seven.

ALL SUPPLEMENTARY

All the supplementary variables are given, with format, on the BCD output medium.

ALTER

This card is used to nominate a variable whose value may be altered to help solve boundary equations. It is described in Section 6.

BASIC

This card is used to specify those variables to be given as output when all the basic variables are not required.

For example

BASIC, A, B

will give the variables A and B as output.

(See Section 10.3.)

CPL

This card specifies the maximum width of the output.

For example

CPL (80)

restricts output to 80 columns and should be used when cards are being punched. (See Section 10.1.)

FILE

This card is used to specify the binary device used when solving boundary equations. (See Section 10.6.)

FREQUENCY

This card is used to specify the frequency with which regular output is given. (See Section 10.2.)

IMPLICIT

This card is used to change the name of the variable in the implicit differential equation. (See Section 9.)

INDEPENDENT

The card is used to specify the independent variable. (See Section 9.)

INTERPOLATE

This card is used to force all conditions to be found by interpolation in the independent variable.

APPENDIX 2 (Continued)

ITERATE

A limit can be set by this card on the number of iterations to be performed during a boundary value problem.

METHOD

This card introduces a new integration method. (See Section 11.)

OUTPUT

This card is used to specify output statements. The standard card is

OUTPUT (WRITE (6,*))

(See Section 10.)

RELAX

A relaxation coefficient may be introduced into the iterations towards a solution to a boundary value problem. (See Section 6.)

SUPPLEMENTARY

This card is used to specify those variables which should be given as output as well as the basic variables.

For example

SUPPLEMENTARY, DY, DX

will cause the supplementary variables DY and DX to be given together with the basic variables. (See Section 10.)

USE

This card directs DEMON to use a particular integration method (See Section 11).

APPENDIX 3

SAMPLE PROGRAMMES

Four sample programmes and the corresponding generated FORTRAN programmes and results are listed. The programmes differ slightly from those in the text. The card

ENTER DEMON, DECK

was used so that the generated FORTRAN programme would be punched. The cards

OUTPUT (WRITE (7, *))

CPL (80)

were used so that the results would also be punched. The cards were then used for the listing.

The times given in the listing are for normal operation where no cards are punched, the FORTRAN programme being written onto tape and the results being printed directly.

In some cases a FREQUENCY card has been used to reduce the volume of output.

SAMPLE PROGRAMME NO 1

GENERATION TIME = 1 MIN 9 SEC

COMPILATION AND LOADING TIME = 1 MIN 6 SEC

EXECUTION TIME = 4 SEC

USER PROGRAMME (WITH CONTROL CARDS)

```
$IBSYS
$ID          12951
$JOB            0002 N.W.BENNETT
$EXECUTE        DEMON
$IBSYS
$IBJOB
$IBFTC
      T=0.0
      Y=1.0
      DY=0.0
      STEP=.25
      ENTER DEMON,DECK
      (Y=0.0,2)
      OUTPUT(WRITE(7,*))
      CPL(80)
      FUNCTION
      IF(T) 1,2,1
    2 D2Y=-1.
      GO TO 3
    1 D2Y=-(DY/T+Y)
    3 CONTINUE
      END DEMON
      CALL EXIT
      END
$ENTRY
$IBSYS
$IBSYS
```

GENERATED FORTRAN PROGRAMME

```
      T=0.0                                                          00001
      Y=1.0                                                          00002
      DY=0.0                                                         00003
      STEP=.25                                                       00004
C DEMON PROGRAMME GENERATED  7 MAY 65                                00005
C     ENTER DEMON,DECK                                               00006
C     (Y=0.0,2)                                                      00007
C     OUTPUT(WRITE(7,*))                                             00008
C     CPL(80)                                                        00009
C     FUNCTION                                                       00010
C     IF(T) 1,2,1                                                    00011
C   2 D2Y=-1.                                                        00012
C     GO TO 3                                                        00013
C   1 D2Y=-(DY/T+Y)                                                  00014
C   3 CONTINUE                                                       00015
C     END DEMON                                                      00016
      DIMENSION OY(00003,00009)                                      00017
      DIMENSION NR(003)                                              00018
      DIMENSION OD(00001),NC(00001)                                  00019
      DIMENSION NM(00001)                                            00020
      NDE = 00003                                                    00021
      N1    = 1                                                      00022
      NF1   = 2                                                      00023
      N2    = 3                                                      00024
      NF2   = 4                                                      00025
      N2D   = 5                                                      00026
      NF2D  = 6                                                      00027
      NF1D  = 7                                                      00028
      DO 04403 NK = 1,00003                                          00029
04403 NR(NK) = NK+7                                                  00030
      DO 4113 NV=1,001                                               00031
 4113 NC(NV)=1                                                       00032
      NM(001) = 2                                                    00033
      OY(00001,N2) = T                                               00034
      OY(00002,N2) = Y                                               00035
      OY(00003,N2) = DY                                              00036
      NB = 2                                                         00037
```

```
      NV = 0                                                            00038
      NF = 001                                                          00039
      GO TO 4799                                                        00040
04404 CONTINUE                                                          00041
      GO TO 4118                                                        00042
 4800 NSAVE      = N1                                                   00043
      N1         = N2                                                   00044
      N2         = NSAVE                                                00045
      NSAVE      = NF1                                                  00046
      NF1        = NF2                                                  00047
      NF2        = NSAVE                                                00048
 4801 MP         = NR(001)                                              00049
      MK2        = NR(002)                                              00050
      DO 04405 NK = 1,001                                               00051
04405 NR(NK) = NR (NK + 002)                                            00052
      DO 4802 NK=1,NDE                                                  00053
 4802 OY(NK,MP)=OY(NK,N1)+STEP*OY(NK,NF1)                               00054
      NSAVE      = MP                                                   00055
      MP         = N2                                                   00056
      N2         = NSAVE                                                00057
      NSAVE      = MK2                                                  00058
      MK2        = NF2                                                  00059
      NF2        = NSAVE                                                00060
      NF = 002                                                          00061
      GO TO 4799                                                        00062
04406 CONTINUE                                                          00063
      NSAVE      = MP                                                   00064
      MP         = N2                                                   00065
      N2         = NSAVE                                                00066
      NSAVE      = MK2                                                  00067
      MK2        = NF2                                                  00068
      NF2        = NSAVE                                                00069
      DO 4803 NK=1,NDE                                                  00070
 4803 OY(NK,N2)=OY(NK,N1)+.5*STEP*(OY(NK,NF1)+OY(NK,MK2))               00071
      DO 04407 NX = 1,001                                               00072
      NK=002-NX                                                         00073
04407 NR(NK+002) = NR(NK)                                               00074
      NR(001) = MP                                                      00075
      NR(002) = MK2                                                     00076
      NF = 003                                                          00077
```

```
      GO TO 4799                                                                00078
04408 CONTINUE                                                                  00079
      IF(NV) 4118,4118,4175                                                     00080
 4799 OY(1,NF2) = 1.                                                            00081
      OY(00002,NF2)=OY(00003,N2)                                                00082
      IF(OY(00001,N2)) 1,2,1                                                    00083
00002 OY(00003,NF2)=-1.                                                         00084
      GO TO 3                                                                   00085
00001 OY(00003,NF2)=-(OY(00003,N2)/OY(00001,N2)+OY(00002,N2))                   00086
00003 CONTINUE                                                                  00087
      IF(NV)4003,4003,4004                                                      00088
04004 GO TO 04409                                                               00089
04409 OZONE= OY(00002,NF2)                                                      00090
      GO TO 4005                                                                00091
 4005 DO 4006 NK=1,NDE                                                          00092
 4006 OY(NK,NF2)=OY(NK,NF2)/OZONE                                               00093
 4003 CONTINUE                                                                  00094
      GO TO (04404,04406,04408),NF                                              00095
04175 GO TO 04402                                                               00096
04410 FORMAT(014H  ES (Y=0.0,2))                                                00097
04402 WRITE(7,04410)                                                            00098
      GO TO 4171                                                                00099
04170 CONTINUE                                                                  00100
 4171 CONTINUE                                                                  00101
04411 FORMAT(1P2X10HT         =E14.7,2X10HY         =E14.7,2X10HDY        =    00102
     1E14.7)                                                                    00103
      WRITE(7,04411)          OY(00001,N2),OY(00002,N2),OY(00003,N2)            00104
 4174 IF (NV) 4150,4150,4176                                                    00105
04176 GO TO 04108                                                               00106
 4118 NS = 1                                                                    00107
      DO 4112 NV = 1,00001                                                      00108
      NP = 0                                                                    00109
 4100 IF (NC(NV)) 4112,4112,4101                                                00110
04101 GO TO 04401                                                               00111
04401 OTP = OY(00002,N2)-(0.0)                                                  00112
 4102 GO TO (4103,4111),NB                                                      00113
 4103 IF (OD(NV)*OTP) 4104,4104,4111                                            00114
 4104 NM(NV)=NM(NV)-1                                                           00115
      IF (NM(NV))4105,4105,4111                                                 00116
04105 NSAVE = N2                                                                00117
```

```
      N2    = N2D                                                    00118
      N2D   = NSAVE                                                  00119
      NSAVE = NF2                                                    00120
      NF2   = NF2D                                                   00121
      NF2D  = NSAVE                                                  00122
      OTEP=STEP                                                      00123
      NSAVE = NF1                                                    00124
      NF1   = NF1D                                                   00125
      NF1D  = NSAVE                                                  00126
      GO TO 04412                                                    00127
04412 OZONE= OY(00002,NF1D)                                          00128
      GO TO 4010                                                     00129
 4010 DO 4011 NK=1,NDE                                               00130
 4011 OY(NK,NF1)=OY(NK,NF1D)/OZONE                                   00131
      STEP=-OD(NV)                                                   00132
      GO TO 4801                                                     00133
 4108 STEP = OTEP                                                    00134
      NSAVE = N2                                                     00135
      N2    = N2D                                                    00136
      N2D   = NSAVE                                                  00137
      NSAVE = NF2                                                    00138
      NF2   = NF2D                                                   00139
      NF2D  = NSAVE                                                  00140
      NSAVE = NF1                                                    00141
      NF1   = NF1D                                                   00142
      NF1D  = NSAVE                                                  00143
      NC(NV)=0                                                       00144
      GO TO 4112                                                     00145
 4111 OD(NV)=OTP                                                     00146
      NS=NS*NP                                                       00147
 4112 CONTINUE                                                       00148
      NB = 1                                                         00149
      NV = 0                                                         00150
      IF(NS) 4160,4160,4161                                          00151
 4160 GO TO 4170                                                     00152
04150 GO TO 4800                                                     00153
 4161 CONTINUE                                                       00154
      CALL EXIT                                                      00155
      END                                                            00156
```

OUTPUT FROM EXECUTION

```
T        = 0.              Y        = 1.0000000E+00  DY       = 0.
T        = 2.5000000E-01   Y        = 9.6875000E-01  DY       =-1.2500000E-01
T        = 5.0000000E-01   Y        = 9.2285156E-01  DY       =-2.4023437E-01
T        = 7.5000000E-01   Y        = 8.4896851E-01  DY       =-3.4490967E-01
T        = 1.0000000E+00   Y        = 7.5058205E-01  DY       =-4.3361568E-01
T        = 1.2500000E+00   Y        = 6.3227293E-01  DY       =-5.0222301E-01
T        = 1.5000000E+00   Y        = 4.9951422E-01  DY       =-5.4772059E-01
T        = 1.7500000E+00   Y        = 3.5838510E-01  DY       =-5.6831717E-01
T        = 2.0000000E+00   Y        = 2.1525479E-01  DY       =-5.6351412E-01
T        = 2.2500000E+00   Y        = 7.6454461E-02  DY       =-5.3411567E-01
T        = 2.5000000E+00   Y        =-5.2045384E-02  DY       =-4.8217092E-01
T        = 2.7500000E+00   Y        =-1.6493456E-01  DY       =-4.1084944E-01
T        = 3.0000000E+00   Y        =-2.5782397E-01  DY       =-3.2425737E-01
T        = 3.2500000E+00   Y        =-3.2745363E-01  DY       =-2.2720454E-01
T        = 3.5000000E+00   Y        =-3.7183718E-01  DY       =-1.2493579E-01
T        = 3.7500000E+00   Y        =-3.9033572E-01  DY       =-2.2841839E-02
T        = 4.0000000E+00   Y        =-3.8365784E-01  DY       = 7.3834013E-02
T        = 4.2500000E+00   Y        =-3.5378685E-01  DY       = 1.6027697E-01
T        = 4.5000000E+00   Y        =-3.0384028E-01  DY       = 2.3235390E-01
T        = 4.7500000E+00   Y        =-2.3787036E-01  DY       = 2.8682480E-01
T        = 5.0000000E+00   Y        =-1.6061772E-01  DY       = 3.2150119E-01
T        = 5.2500000E+00   Y        =-7.7232499E-02  DY       = 3.3534307E-01
ES (Y=0.0,2)
T        = 5.4792621E+00   Y        = 0.             DY       = 3.2983489E-01
```

SAMPLE PROGRAMME NO 2

GENERATION TIME = 1 MIN 46 SEC

COMPILATION AND LOADING TIME = 1 MIN 36 SEC

EXECUTION TIME = 26 SEC

USER PROGRAMME

```
      T=0.0
      Y=0.0
      X=0.0
      DY=100.
      DX=100.
      STEP=1./128.
      ENTER DEMON,DECK
      OUTPUT (WRITE(7,*))
      CPL(80)
      FREQ(16)
      USE(PC2)
      METHOD(PC2)
      ALLOT(LF3,LF4)
      OY(NK,NF2)=FUNCTION(OY(NK,N2))
      EXAMINE
      ROTATE(LF4,LF3,NF1,NF2)(N1,N2)
      CALCULATE(N1,NF1,N2,NF2)
      EXAMINE
      ROTATE(LF4,LF3,NF1,NF2)(N1,N2)
      CALCULATE(N1,NF1,N2,NF2)
      LOOP
4900  ROTATE(LF4,LF3,NF1,NF2)(N1,N2)
      DO 4901 NK=1,NDE
4901  OY(NK,N2)=OY(NK,N1)+STEP*(23.*OY(NK,NF1)-16.*OY(NK,LF3)+5.*OY(NK,L
     1F4))/12.
      OY(NK,NF2)=FUNCTION(OY(NK,N2))
      DO 4902 NK=1,NDE
4902  OY(NK,N2)=OY(NK,N1)+STEP*(5.*OY(NK,NF2)+8.*OY(NK,NF1)-OY(NK,LF3))/
     112.
      OY(NK,NF2)=FUNCTION(OY(NK,N2))
```

```
      END
      ALTER(DY),.01
      ALTER(DX),.01
      Y(X=100.)=50.,.001
      DY(X=100.)-0.0,.00001
      ITERATE (6)
      FUNCTION
      D2Y=-32.2-ABS(DY)*DY*.01
      D2X=-.01*ABS(DX)*DX
      END DEMON
      CALL EXIT
      END
```

GENERATED FORTRAN PROGRAMME

```
      T=0.0                                                          00001
      Y=0.0                                                          00002
      X=0.0                                                          00003
      DY=100.                                                        00004
      DX=100.                                                        00005
      STEP=1./128.                                                   00006
C DEMON PROGRAMME GENERATED 15 JUN 65                                00007
C     ENTER DEMON,DECK                                               00008
C     OUTPUT (WRITE(7,*))                                            00009
C     CPL(80)                                                        00010
C     FREQ(16)                                                       00011
C     USE(PC2)                                                       00012
C     METHOD(PC2)                                                    00013
C     END                                                            00014
C     ALTER(DY),.01                                                  00015
C     ALTER(DX),.01                                                  00016
C     Y(X=100.)=50.,.001                                             00017
C     DY(X=100.)=0.0,.00001                                          00018
C     ITERATE (6)                                                    00019
C     FUNCTION                                                       00020
C     D2Y=-32.2-ABS(DY)*DY*.01                                       00021
C     D2X=-.01*ABS(DX)*DX                                            00022
C     END DEMON                                                      00023
      DIMENSION OY(00005,00011)                                      00024
      DIMENSION NR(005)                                              00025
```

```
      DIMENSION CD(00001),NC(00001)                                    00026
      DIMENSION DI(00002),DN(00002),SIDW(00002,00003)                  00027
      NDE = 00005                                                      00028
      N1    = 1                                                        00029
      NF1   = 2                                                        00030
      N2    = 3                                                        00031
      NF2   = 4                                                        00032
      N2D   = 5                                                        00033
      NF2D  = 6                                                        00034
      NF1D  = 7                                                        00035
      DI(00001) = DY                                                   00036
      DI(00002) = DX                                                   00037
      REWIND 0                                                         00038
      NI=-1                                                            00039
 4186 NH=0                                                             00040
      NI=NI+1                                                          00041
      DO 4180 NJ = 1,003                                               00042
      DO 4113 NV=1,001                                                 00043
 4113 NC(NV)=1                                                         00044
      DO 04406 NK = 1,00005                                            00045
04406 NR(NK) = NK+7                                                    00046
      DY(00001,N2) = T                                                 00047
      DY(00002,N2) = Y                                                 00048
      DY(00003,N2) = DY                                                00049
      DY(00004,N2) = X                                                 00050
      DY(00005,N2) = DX                                                00051
      DY(00003,N2)=DI(00001)                                           00052
      DY(00005,N2)=DI(00002)                                           00053
      IF(NJ-1) 4230,4230,4232                                          00054
 4230 CONTINUE                                                         00055
04407 FORMAT(1P3X14HINITIAL VALUE I4,2X10HDY       =E14.7,2X10HDX      00056
     1=E14.7)                                                          00057
      WRITE(7,04407)          NI,DY(00003,N2),DY(00005,N2)             00058
 4232 CONTINUE                                                         00059
      GO TO (04124,04401,04402),NJ                                     00060
04401 ODEL=.01                                                         00061
      DY(00003,N2)=DY(00003,N2)+ ODEL                                  00062
      GO TO 4124                                                       00063
04402 ODEL=.01                                                         00064
      DY(00005,N2)=DY(00005,N2)+ ODEL                                  00065
```

```
 4124 CONTINUE                                                    00066
      NQ = 0                                                      00067
      NB = 2                                                      00068
      NV = 0                                                      00069
      LF3        = NR(001)                                        00070
      LF4        = NR(002)                                        00071
      DO 04408 NK = 1,003                                         00072
04408 NR(NK) = NR (NK + 002)                                      00073
      NF = 001                                                    00074
      GO TO 4799                                                  00075
04409 CONTINUE                                                    00076
      NPC = 001                                                   00077
      GO TO 4118                                                  00078
04410 CONTINUE                                                    00079
      NSAVE      = LF4                                          00080
      LF4        = LF3                                          00081
      LF3        = NF1                                          00082
      NF1        = NF2                                          00083
      NF2        = NSAVE                                        00084
      NSAVE      = N1                                           00085
      N1         = N2                                           00086
      N2         = NSAVE                                        00087
      NCPC = 001                                                  00088
      GO TO 4801                                                  00089
04411 NCPC = 0                                                    00090
      NPC = 002                                                   00091
      GO TO 4118                                                  00092
04412 CONTINUE                                                    00093
      NSAVE      = LF4                                          00094
      LF4        = LF3                                          00095
      LF3        = NF1                                          00096
      NF1        = NF2                                          00097
      NF2        = NSAVE                                        00098
      NSAVE      = N1                                           00099
      N1         = N2                                           00100
      N2         = NSAVE                                        00101
      NCPC = 002                                                  00102
      GO TO 4801                                                  00103
04413 NCPC = 0                                                    00104
      NPC = 003                                                   00105
```

```
      GO TO 4118                                                        00106
04414 CONTINUE                                                          00107
 4900 NSAVE     = LF4                                                   00108
      LF4       = LF3                                                   00109
      LF3       = NF1                                                   00110
      NF1       = NF2                                                   00111
      NF2       = NSAVE                                                 00112
      NSAVE     = N1                                                    00113
      N1        = N2                                                    00114
      N2        = NSAVE                                                 00115
      DO 4901 NK=1,NDE                                                  00116
 4901 OY(NK,N2)=OY(NK,N1)+STEP*(23.*OY(NK,NF1)-16.*OY(NK,LF3)+5.*OY(NK,L 00117
     1F4))/12.                                                          00118
      NF = 002                                                          00119
      GO TO 4799                                                        00120
04415 CONTINUE                                                          00121
      DO 4902 NK=1,NDE                                                  00122
 4902 OY(NK,N2)=OY(NK,N1)+STEP*(5.*OY(NK,NF2)+8.*OY(NK,NF1)-OY(NK,LF3))/ 00123
     112.                                                               00124
      NF = 003                                                          00125
      GO TO 4799                                                        00126
04416 CONTINUE                                                          00127
      NPC = 004                                                         00128
      GO TO 4118                                                        00129
 4200 CONTINUE                                                          00130
      NF = 004                                                          00131
      GO TO 4799                                                        00132
04417 CONTINUE                                                          00133
      GO TO 4118                                                        00134
 4800 NSAVE     = N1                                                    00135
      N1        = N2                                                    00136
      N2        = NSAVE                                                 00137
      NSAVE     = NF1                                                   00138
      NF1       = NF2                                                   00139
      NF2       = NSAVE                                                 00140
 4801 MP        = NR(001)                                               00141
      MK2       = NR(002)                                               00142
      DO 04418 NK = 1,003                                               00143
04418 NR(NK) = NR (NK + 002)                                            00144
      DO 4802 NK=1,NDE                                                  00145
```

```
 4802 OY(NK,MP)=OY(NK,N1)+STEP*OY(NK,NF1)                                00146
      NSAVE      = MP                                                    00147
      MP         = N2                                                    00148
      N2         = NSAVE                                                 00149
      NSAVE      = MK2                                                   00150
      MK2        = NF2                                                   00151
      NF2        = NSAVE                                                 00152
      NF = 005                                                           00153
      GO TO 4799                                                         00154
04419 CONTINUE                                                           00155
      NSAVE      = MP                                                    00156
      MP         = N2                                                    00157
      N2         = NSAVE                                                 00158
      NSAVE      = MK2                                                   00159
      MK2        = NF2                                                   00160
      NF2        = NSAVE                                                 00161
      DO 4803 NK=1,NDE                                                   00162
 4803 OY(NK,N2)=OY(NK,N1)+.5*STEP*(OY(NK,NF1)+OY(NK,MK2))                00163
      DO 04420 NX = 1,003                                                00164
      NK=004-NX                                                          00165
04420 NR(NK+002) = NR(NK)                                                00166
      NR(001) = MP                                                       00167
      NR(002) = MK2                                                      00168
      NF = 006                                                           00169
      GO TO 4799                                                         00170
04421 CONTINUE                                                           00171
      IF(NCPC) 4116,4116,4114                                            00172
04114 GO TO (04411,04413),NCPC                                           00173
04116 IF(NV) 4118,4118,4173                                              00174
 4799 OY(1,NF2) = 1.                                                     00175
      OY(00002,NF2)=OY(00003,N2)                                         00176
      OY(00004,NF2)=OY(00005,N2)                                         00177
      OY(00003,NF2)=-32.2-ABS(OY(00003,N2))*OY(00003,N2)*.01             00178
      OY(00005,NF2)=-.01*ABS(OY(00005,N2))*OY(00005,N2)                  00179
      IF(NV)4003,4003,4004                                               00180
04004 GO TO 04422                                                        00181
04422 OZONE= OY(00004,NF2)                                               00182
      GO TO 4005                                                         00183
 4005 DO 4006 NK=1,NDE                                                   00184
 4006 OY(NK,NF2)=OY(NK,NF2)/OZONE                                        00185
```

```
 4003 CONTINUE                                                          00186
      GO TO (04409,04415,04416,04417,04419,04421),NF                    00187
04175 GO TO 04404                                                       00188
04423 FORMAT(013H  AT (X=100.))                                         00189
04404 WRITE(7,04423)                                                    00190
      GO TO 4171                                                        00191
04170 CONTINUE                                                          00192
 4171 CONTINUE                                                          00193
04424 FORMAT(1P2X10HT        =E14.7,2X10HY        =E14.7,2X10HDY       =  00194
     1E14.7)                                                            00195
      WRITE(7,04424)          OY(00001,N2),OY(00002,N2),OY(00003,N2)    00196
04425 FORMAT(1P2X10HX        =E14.7,2X10HDX       =E14.7)               00197
      WRITE(7,04425)          OY(00004,N2),OY(00005,N2)                 00198
      GO TO 4220                                                        00199
 4118 NS = 1                                                            00200
      DO 4112 NV = 1,00001                                              00201
      NP = 0                                                            00202
 4100 IF (NC(NV)) 4112,4112,4101                                        00203
04101 GO TO 04403                                                       00204
04403 OTP = OY(00004,N2)-(100.)                                         00205
 4102 GO TO (4103,4111),NB                                              00206
 4103 IF (OD(NV)*OTP) 4104,4104,4111                                    00207
 4104 CONTINUE                                                          00208
04105 NSAVE = N2                                                        00209
      N2    = N2D                                                       00210
      N2D   = NSAVE                                                     00211
      NSAVE = NF2                                                       00212
      NF2   = NF2D                                                      00213
      NF2D  = NSAVE                                                     00214
      OTEP=STEP                                                         00215
      NSAVE = NF1                                                       00216
      NF1   = NF1D                                                      00217
      NF1D  = NSAVE                                                     00218
      GO TO 04426                                                       00219
04426 OZONE= OY(00004,NF1D)                                             00220
      GO TO 4010                                                        00221
 4010 DO 4011 NK=1,NDE                                                  00222
 4011 OY(NK,NF1)=OY(NK,NF1D)/OZONE                                      00223
      STEP=-OD(NV)                                                      00224
      GO TO 4801                                                        00225
```

```
04405 000001 = OY(00002,N2)                                                    00226
      000002 = OY(00003,N2)                                                    00227
 4108 STEP = OTEP                                                              00228
      NSAVE = N2                                                               00229
      N2    = N2D                                                              00230
      N2D   = NSAVE                                                            00231
      NSAVE = NF2                                                              00232
      NF2   = NF2D                                                             00233
      NF2D  = NSAVE                                                            00234
      NSAVE = NF1                                                              00235
      NF1   = NF1D                                                             00236
      NF1D  = NSAVE                                                            00237
      NC(NV)=0                                                                 00238
      GO TO 4112                                                               00239
 4111 OD(NV)=OTP                                                               00240
      NS=NS*NP                                                                 00241
 4112 CONTINUE                                                                 00242
      NB = 1                                                                   00243
      NV = 0                                                                   00244
      IF(NS) 4160,4160,4161                                                    00245
 4160 NQ=NQ-1                                                                  00246
      IF (NQ) 4162,4162,4150                                                   00247
 4162 NQ = 16                                                                  00248
      GO TO 4173                                                               00249
04150 GO TO (04410,04412,04414,04900),NPC                                      00250
 4161 CONTINUE                                                                 00251
      REWIND 0                                                                 00252
      ON(00001)=000001   -(50.)                                                00253
      ON(00002)=000002    -(0.0)                                               00254
      IF(NJ-1) 4182,4205,4182                                                  00255
 4182 DO 4183 NK=1,00002                                                       00256
 4183 SIDW(NK,NJ-1) = (SIDW(NK,00003)-ON(NK))/ODEL                             00257
      IF(NJ-00003) 4180,4184,4184                                              00258
 4184 OZ = SIDW(1,1)*SIDW(2,2)-SIDW(2,1)*SIDW(1,2)                             00259
      IF(OZ) 8803,8802,8803                                                    00260
 8803 ODEL =(SIDW(1,3)*SIDW(2,2)-SIDW(2,3)*SIDW(1,2))/OZ                       00261
      SIDW(2,3) =(SIDW(2,3)*SIDW(1,1)-SIDW(1,3)*SIDW(2,1))/OZ                  00262
      SIDW(1,3) = ODEL                                                         00263
      DO 4185 NK = 1,00002                                                     00264
 4185 OI(NK) = OI(NK) + SIDW(NK,00003)                                         00265
```

```
      GO TO 4186                                                          00266
 4030 FORMAT(18H  ZERO DETERMINANT)                                       00267
08802 WRITE(7,04030)                                                      00268
      CALL EXIT                                                           00269
 4208 FORMAT(33H  ACHIEVED-WANTED VALUES FOR RUN ,I4,7H FOLLOW)           00270
04205 WRITE(7,04208)          NI                                          00271
04427 FORMAT(1P2X10HON(001)  =E14.7,2X10HON(002)  =E14.7)                 00272
      WRITE(7,04427)           ON(001)  ,ON(002)                        00273
      IF((.001)**2-ON(00001)**2)4191,04428,04428                          00274
04428 IF((.00001)**2-ON(00002)**2)4191,04429,04429                        00275
04429 GO TO 4193                                                          00276
 4191 IF(NI-6)4250,4192,4192                                              00277
 4250 DO 4241 NK = 1,00002                                                00278
 4241 SIDW(NK,00003)=ON(NK)                                               00279
      GO TO 4180                                                          00280
 4199 FORMAT(19H  ITERATION STOPPED)                                      00281
04192 WRITE(7,04199)                                                      00282
      GO TO 4220                                                          00283
 4194 FORMAT(21H  ITERATION CONVERGED)                                    00284
04193 WRITE(7,04194)                                                      00285
 4220 NH=NH-1                                                             00286
      IF(NH)4222,4221,4221                                                00287
04221 READ(0)                          NV,(OY(NK,N2),OY(NK,NF2),NK=1,NDE  00288
     1)                                                                   00289
 4195 IF(NV)4170,4170,4175                                                00290
 4173 IF(NJ-1)4174,4240,4174                                              00291
 4240 NH=NH+1                                                             00292
      WRITE(0)                          NV,(OY(NK,N2),OY(NK,NF2),NK=1,NDE  00293
     1)                                                                   00294
 4174 IF(NV)4150,4150,4176                                                00295
04176 GO TO 04405                                                         00296
 4180 CONTINUE                                                            00297
 4222 CONTINUE                                                            00298
      CALL EXIT                                                           00299
      END                                                                 00300
```

OUTPUT FROM EXECUTION

```
 INITIAL VALUE   -0  DY       = 1.0000000E+02  DX       = 1.0000000E+02
ACHIEVED-WANTED VALUES FOR RUN   -0 FOLLOW
ON(001)  = 2.0300140E+01  ON(002)  = 4.5272034E+00
 INITIAL VALUE    1  DY       = 7.2338670E+01  DX       = 1.0404929E+02
ACHIEVED-WANTED VALUES FOR RUN    1 FOLLOW
ON(001)  =-1.7932920E+00  ON(002)  =-1.7856156E+00
 INITIAL VALUE    2  DY       = 7.4317315E+01  DX       = 1.0607112E+02
ACHIEVED-WANTED VALUES FOR RUN    2 FOLLOW
ON(001)  =-5.6120396E-02  ON(002)  =-3.1475182E-02
 INITIAL VALUE    3  DY       = 7.4383297E+01  DX       = 1.0608573E+02
ACHIEVED-WANTED VALUES FOR RUN    3 FOLLOW
ON(001)  =-2.7179718E-05  ON(002)  =-3.3844262E-06
ITERATION CONVERGED
T        = 0.              Y        = 0.              DY       = 7.4383297E+01
X        = 0.              DX       = 1.0608573E+02
T        = 1.2499999E-01   Y        = 8.6532114E+00   DY       = 6.4357576E+01
X        = 1.2452187E+01   DX       = 9.3665118E+01
T        = 2.4999996E-01   Y        = 1.6151429E+01   DY       = 5.5827139E+01
X        = 2.3524123E+01   DX       = 8.3848066E+01
T        = 3.7499990E-01   Y        = 2.2656283E+01   DY       = 4.8411360E+01
X        = 3.3491464E+01   DX       = 7.5893642E+01
T        = 4.9999984E-01   Y        = 2.8289483E+01   DY       = 4.1843228E+01
X        = 4.2554754E+01   DX       = 6.9317672E+01
T        = 6.2499972E-01   Y        = 3.3144267E+01   DY       = 3.5929068E+01
X        = 5.0864439E+01   DX       = 6.3790414E+01
T        = 7.4999960E-01   Y        = 3.7292915E+01   DY       = 3.0524119E+01
X        = 5.8536279E+01   DX       = 5.9079526E+01
T        = 8.7499948E-01   Y        = 4.0791837E+01   DY       = 2.5517109E+01
X        = 6.5661252E+01   DX       = 5.5016579E+01
T        = 9.9999936E-01   Y        = 4.3685080E+01   DY       = 2.0820140E+01
X        = 7.2312157E+01   DX       = 5.1476499E+01
T        = 1.1249991E+00   Y        = 4.6006793E+01   DY       = 1.6361840E+01
X        = 7.8548166E+01   DX       = 4.8364455E+01
T        = 1.2499989E+00   Y        = 4.7782979E+01   DY       = 1.2082544E+01
X        = 8.4418015E+01   DX       = 4.5607239E+01
T        = 1.3749987E+00   Y        = 4.9032728E+01   DY       = 7.9307974E+00
X        = 8.9962334E+01   DX       = 4.3147441E+01
```

```
T        = 1.4999984E+00   Y        = 4.9769067E+01   DY       = 3.8606959E+00
X        = 9.5215339E+01   DX       = 4.0939399E+01
AT (X=100.)
T        = 1.6197112E+00   Y        = 4.9999973E+01   DY       =-3.3844262E-06
X        = 1.0000000E+02   DX       = 3.9026705E+01
```

SAMPLE PROGRAMME NO 3

GENERATION TIME = 1 MIN 22 SEC

COMPILATION AND LOADING TIME = 1 MIN 13 SEC

EXECUTION TIME = 4 SEC

USER PROGRAMME

```
      DIMENSION F(5)
      T=0.0
      DO 2 I=1,5
    2 F(I)=100.
      DELX=1.
      FG=50.
      ALPHA=.1
      H=.5
      STEP=1./8.
      ENTER DEMON,DECK
      FREQ(8)
      (T=10.)
      OUTPUT (WRITE(7,*))
      CPL(80)
      FUNCTION
      DIMENSION F(5)
      DF(1)=0.0
      DO 1 I=2,4
    1 DF(I)=ALPHA*(F(I+1)-2.*F(I)+F(I-1))/DELX**2
      FSIX=F(4)-2.*DELX*H*(F(5)-FG)
      DF(5)=ALPHA*(FSIX-2.*F(5)+F(4))/DELX**2
      END DEMON
      CALL EXIT
      END
```

GENERATED FORTRAN PROGRAMME

```
      DIMENSION F(5)                                                    00001
      T=0.0                                                             00002
      DO 2 I=1,5                                                        00003
    2 F(I)=100.                                                         00004
      DELX=1.                                                           00005
      FG=50.                                                            00006
      ALPHA=.1                                                          00007
      H=.5                                                              00008
      STEP=1./8.                                                        00009
C DEMON PROGRAMME GENERATED 15 JUN 65                                   00010
C     ENTER DEMON,DECK                                                  00011
C     FREQ(8)                                                           00012
C     (T=10.)                                                           00013
C     OUTPUT (WRITE(7,*))                                               00014
C     CPL(80)                                                           00015
C     FUNCTION                                                          00016
C     DIMENSION F(5)                                                    00017
C     DF(1)=0.0                                                         00018
C     DO 1 I=2,4                                                        00019
C   1 DF(I)=ALPHA*(F(I+1)-2.*F(I)+F(I-1))/DELX**2                       00020
C     FSIX=F(4)-2.*DELX*H*(F(5)-FG)                                     00021
C     DF(5)=ALPHA*(FSIX-2.*F(5)+F(4))/DELX**2                           00022
C     END DEMON                                                         00023
      DIMENSION OY(00006,00009)                                         00024
      DIMENSION NR(003)                                                 00025
      DIMENSION OD(00001),NC(00001)                                     00026
      NDE = 00006                                                       00027
      N1    = 1                                                         00028
      NF1   = 2                                                         00029
      N2    = 3                                                         00030
      NF2   = 4                                                         00031
      N2D   = 5                                                         00032
      NF2D  = 6                                                         00033
      NF1D  = 7                                                         00034
      DO 4113 NV=1,001                                                  00035
 4113 NC(NV)=1                                                          00036
      DO 04404 NK = 1,00003                                             00037
```

```
04404 NR(NK) = NK+7                                                    00038
      OY(00001,N2) = T                                                 00039
      DO 04405 NY1 = 1,00005                                           00040
      NY01 = 00002+(NY1-1)                                             00041
04405 OY(NY01,N2) =F          (NY1)                                    00042
      NQ = 0                                                           00043
      NB = 2                                                           00044
      NV = 0                                                           00045
      NF = 001                                                         00046
      GO TO 4799                                                       00047
04406 CONTINUE                                                         00048
      GO TO 4118                                                       00049
 4800 NSAVE      = N1                                                  00050
      N1         = N2                                                  00051
      N2         = NSAVE                                               00052
      NSAVE      = NF1                                                 00053
      NF1        = NF2                                                 00054
      NF2        = NSAVE                                               00055
 4801 MP         = NR(001)                                             00056
      MK2        = NR(002)                                             00057
      DO 04407 NK = 1,001                                              00058
04407 NR(NK) = NR (NK + 002)                                           00059
      DO 4802 NK=1,NDE                                                 00060
 4802 OY(NK,MP)=OY(NK,N1)+STEP*OY(NK,NF1)                              00061
      NSAVE      = MP                                                  00062
      MP         = N2                                                  00063
      N2         = NSAVE                                               00064
      NSAVE      = MK2                                                 00065
      MK2        = NF2                                                 00066
      NF2        = NSAVE                                               00067
      NF = 002                                                         00068
      GO TO 4799                                                       00069
04408 CONTINUE                                                         00070
      NSAVE      = MP                                                  00071
      MP         = N2                                                  00072
      N2         = NSAVE                                               00073
      NSAVE      = MK2                                                 00074
      MK2        = NF2                                                 00075
      NF2        = NSAVE                                               00076
      DO 4803 NK=1,NDE                                                 00077
```

```
 4803 OY(NK,N2)=OY(NK,N1)+.5*STEP*(OY(NK,NF1)+OY(NK,MK2))                  00078
      DO 04409 NX = 1,001                                                  00079
      NK=002-NX                                                            00080
04409 NR(NK+002) = NR(NK)                                                  00081
      NR(001) = MP                                                         00082
      NR(002) = MK2                                                        00083
      NF = 003                                                             00084
      GO TO 4799                                                           00085
04410 CONTINUE                                                             00086
      IF(NV) 4118,4118,4175                                                00087
 4799 OY(1,NF2) = 1.                                                       00088
      NY01=00002+(1-1)                                                     00089
      OY(NY01,NF2)=0.0                                                     00090
      DO04401I=2,4                                                         00091
00001 NY01=00002+(I-1)                                                     00092
      NY02=00002+(I+1-1)                                                   00093
      NY03=00002+(I-1)                                                     00094
      NY04=00002+(I-1-1)                                                   00095
04401 OY(NY01,NF2)=ALPHA*(OY(NY02,N2)-2.*OY(NY03,N2)+OY(NY04,N2))/DELX**   00096
     12                                                                    00097
      NY01=00002+(4-1)                                                     00098
      NY02=00002+(5-1)                                                     00099
      FSIX=OY(NY01,N2)-2.*DELX*H*(OY(NY02,N2)-FG)                          00100
      NY01=00002+(5-1)                                                     00101
      NY02=00002+(5-1)                                                     00102
      NY03=00002+(4-1)                                                     00103
      OY(NY01,NF2)=ALPHA*(FSIX-2.*OY(NY02,N2)+OY(NY03,N2))/DELX**2         00104
      IF(NV)4003,4003,4004                                                 00105
04004 GO TO 04411                                                          00106
04411 OZONE= OY(00001,NF2)                                                 00107
      GO TO 4005                                                           00108
 4005 DO 4006 NK=1,NDE                                                     00109
 4006 OY(NK,NF2)=OY(NK,NF2)/OZONE                                          00110
 4003 CONTINUE                                                             00111
      GO TO (04406,04408,04410),NF                                         00112
04175 GO TO 04403                                                          00113
04412 FORMAT(012H  ES (T=10.))                                             00114
04403 WRITE(7,04412)                                                       00115
      GO TO 4171                                                           00116
04170 CONTINUE                                                             00117
```

```
 4171 CONTINUE                                                                  00118
04413 FORMAT(1P2X10HT         =E14.7,2X10HF(1)      =E14.7,2X10HF(2)      =    00119
     1E14.7)                                                                    00120
      NY01=00002+(1-1)                                                          00121
      NY02=00002+(2-1)                                                          00122
      WRITE(7,04413)          OY(00001,N2),OY(NY01,N2),OY(NY02,N2)              00123
04414 FORMAT(1P2X10HF(3)      =E14.7,2X10HF(4)      =E14.7,2X10HF(5)      =    00124
     1E14.7)                                                                    00125
      NY01=00002+(3-1)                                                          00126
      NY02=00002+(4-1)                                                          00127
      NY03=00002+(5-1)                                                          00128
      WRITE(7,04414)          OY(NY01,N2),OY(NY02,N2),OY(NY03,N2)               00129
 4174 IF (NV) 4150,4150,4176                                                    00130
04176 GO TO 04108                                                               00131
 4118 NS = 1                                                                    00132
      DO 4112 NV = 1,00001                                                      00133
      NP = 0                                                                    00134
 4100 IF (NC(NV)) 4112,4112,4101                                                00135
04101 GO TO 04402                                                               00136
04402 OTP = OY(00001,N2)-(10.)                                                  00137
 4102 GO TO (4103,4111),N8                                                      00138
 4103 IF (OD(NV)*OTP) 4104,4104,4111                                            00139
 4104 CONTINUE                                                                  00140
04105 NSAVE = N2                                                                00141
      N2    = N2D                                                               00142
      N2D   = NSAVE                                                             00143
      NSAVE = NF2                                                               00144
      NF2   = NF2D                                                              00145
      NF2D  = NSAVE                                                             00146
      OTEP=STEP                                                                 00147
      NSAVE = NF1                                                               00148
      NF1   = NF1D                                                              00149
      NF1D  = NSAVE                                                             00150
      GO TO 04415                                                               00151
04415 OZONE= OY(00001,NF1D)                                                     00152
      GO TO 4010                                                                00153
 4010 DO 4011 NK=1,NDE                                                          00154
 4011 OY(NK,NF1)=OY(NK,NF1D)/OZONE                                              00155
      STEP=-OD(NV)                                                              00156
      GO TO 4801                                                                00157
```

```
 4108 STEP = OTEP                                                       00158
      NSAVE = N2                                                        00159
      N2    = N2D                                                       00160
      N2D   = NSAVE                                                     00161
      NSAVE = NF2                                                       00162
      NF2   = NF2D                                                      00163
      NF2D  = NSAVE                                                     00164
      NSAVE = NF1                                                       00165
      NF1   = NF1D                                                      00166
      NF1D  = NSAVE                                                     00167
      NC(NV)=0                                                          00168
      GO TO 4112                                                        00169
 4111 OD(NV)=OTP                                                        00170
      NS=NS*NP                                                          00171
 4112 CONTINUE                                                          00172
      NB = 1                                                            00173
      NV = 0                                                            00174
      IF(NS) 4160,4160,4161                                             00175
 4160 NQ=NQ-1                                                           00176
      IF (NQ) 4162,4162,4150                                            00177
 4162 NQ = 8                                                            00178
      GO TO 4170                                                        00179
04150 GO TO 4800                                                        00180
 4161 CONTINUE                                                          00181
      CALL EXIT                                                         00182
      END                                                               00183
```

OUTPUT FROM EXECUTION

```
 T       = 0.              F(1)    = 1.0000000E+02  F(2)    = 1.0000000E+02
 F(3)    = 1.0000000E+02   F(4)    = 1.0000000E+02  F(5)    = 1.0000000E+02
 T       = 1.0000000E+00   F(1)    = 1.0000000E+02  F(2)    = 9.9999828E+01
 F(3)    = 9.9993043E+01   F(4)    = 9.9787008E+01  F(5)    = 9.5667620E+01
 T       = 2.0000000E+00   F(1)    = 1.0000000E+02  F(2)    = 9.9997667E+01
 F(3)    = 9.9952465E+01   F(4)    = 9.9270393E+01  F(5)    = 9.2391106E+01
 T       = 3.0000000E+00   F(1)    = 1.0000000E+02  F(2)    = 9.9989995E+01
 F(3)    = 9.9863112E+01   F(4)    = 9.8581380E+01  F(5)    = 8.9857190E+01
 T       = 4.0000000E+00   F(1)    = 1.0000000E+02  F(2)    = 9.9973172E+01
 F(3)    = 9.9721728E+01   F(4)    = 9.7803212E+01  F(5)    = 8.7851791E+01
 T       = 5.0000000E+00   F(1)    = 1.0000000E+02  F(2)    = 9.9944249E+01
```

```
F(3)      = 9.9531324E+01  F(4)      = 9.6988014E+01  F(5)      = 8.6227656E+01
T         = 5.9999999E+00  F(1)      = 1.0000000E+02  F(2)      = 9.9901242E+01
F(3)      = 9.9297859E+01  F(4)      = 9.6167801E+01  F(5)      = 8.4882733E+01
T         = 6.9999999E+00  F(1)      = 1.0000000E+02  F(2)      = 9.9843128E+01
F(3)      = 9.9028325E+01  F(4)      = 9.5361670E+01  F(5)      = 8.3745689E+01
T         = 7.9999999E+00  F(1)      = 1.0000000E+02  F(2)      = 9.9769702E+01
F(3)      = 9.8729709E+01  F(4)      = 9.4580477E+01  F(5)      = 8.2766176E+01
T         = 8.9999999E+00  F(1)      = 1.0000000E+02  F(2)      = 9.9681416E+01
F(3)      = 9.8408471E+01  F(4)      = 9.3829870E+01  F(5)      = 8.1908251E+01
ES (T=10.)
T         = 1.0000000E+01  F(1)      = 1.0000000E+02  F(2)      = 9.9579184E+01
F(3)      = 9.8070305E+01  F(4)      = 9.3112269E+01  F(5)      = 8.1145951E+01
```

SAMPLE PROGRAMME NO 4

GENERATION TIME = 1 MIN 26 SEC

COMPILATION AND LOADING TIME = 1 MIN 22 SEC

EXECUTION TIME = 5 SEC

USER PROGRAMME

```
 T=0.0
 X=1.
 Y=1.
 STEP=1.
 ENTER DEMON, DECK
 OUTPUT (WRITE(7,*))
 CPL(80)
 R(T=0.0)=0.0       ,.0001
 P(T=0.0)=0.0       ,.0001
 ALTER(X),.0001
 ALTER(Y),.0001
 ITERATE(100)
 RELAX(EXP(-(ABS(ON(1))+ABS(ON(2)))))
 FUNCTION
 R=(X-1.)**2+Y**2-1.
 P=X*Y-.25
 END DEMON
 CALL EXIT
 END
```

OUTPUT FROM EXECUTION

```
 INITIAL VALUE   -0  X         = 1.0000000E+00  Y         = 1.0000000E+00
ACHIEVED-WANTED VALUES FOR RUN   -0 FOLLOW
ON(001)  = 0.              ON(002)  = 7.5000000E-01
 INITIAL VALUE    1  X         = 6.4578455E-01  Y         = 1.0000000E+00
ACHIEVED-WANTED VALUES FOR RUN    1 FOLLOW
ON(001)  = 1.2546858E-01  ON(002)  = 3.9578455E-01
 INITIAL VALUE    2  X         = 4.7413757E-01  Y         = 9.0194932E-01
ACHIEVED-WANTED VALUES FOR RUN    2 FOLLOW
ON(001)  = 9.0043857E-02  ON(002)  = 1.7764806E-01
 INITIAL VALUE    3  X         = 3.7417082E-01  Y         = 8.0549166E-01
ACHIEVED-WANTED VALUES FOR RUN    3 FOLLOW
ON(001)  = 4.0478960E-02  ON(002)  = 5.1391479E-02
 INITIAL VALUE    4  X         = 3.3923263E-01  Y         = 7.5543136E-01
ACHIEVED-WANTED VALUES FOR RUN    4 FOLLOW
ON(001)  = 7.2900503E-03  ON(002)  = 6.2669665E-03
 INITIAL VALUE    5  X         = 3.3489204E-01  Y         = 7.4687512E-01
ACHIEVED-WANTED VALUES FOR RUN    5 FOLLOW
ON(001)  = 1.9103289E-04  ON(002)  = 1.2252852E 04
 INITIAL VALUE    6  X         = 3.3481582E-01  Y         = 7.4667941E-01
ACHIEVED-WANTED VALUES FOR RUN    6 FOLLOW
ON(001)  = 1.3411045E-07  ON(002)  = 7.8231096E-08
ITERATION CONVERGED
T         = 0.
AT (T=0.0)
T         = 0.
```

APPENDIX 4

SAMPLE METHODS

A listing is given of the integration methods referred to in Section 11.

```
      SAMPLE METHODS.
      ***************
 THE FOLLOWING METHODS ARE DISCUSSED IN CHAPTER 11.  THE USE CARD
 HAS BEEN INCLUDED.


 SECOND ORDER RUNGE-KUTTA.
 *************************

 USE(RK2)
 METHOD(RK2)
 OY(NK,NF2)=FUNCTION(OY(NK,N2))
 LOOP
4800 ROTATE(N1,N2)(NF1,NF2)
4801 ALLOT (MP,MK2)
 DO 4802 NK=1,NDE
4802 OY(NK,MP)=OY(NK,N1)+STEP*OY(NK,NF1)
 OY(NK,MK2)=FUNCTION(OY(NK,MP))
 DO 4803 NK=1,NDE
4803 OY(NK,N2)=OY(NK,N1)+.5*STEP*(OY(NK,NF1)+OY(NK,MK2))
 RESTORE(MP,MK2)
 OY(NK,NF2)=FUNCTION(OY(NK,N2))
 END


 SECOND ORDER PREDICTOR-CORRECTOR.
 *********************************

 USE(PC2)
 METHOD(PC2)
 ALLOT(LF3,LF4)
 OY(NK,NF2)=FUNCTION(OY(NK,N2))
 EXAMINE
 ROTATE(LF4,LF3,NF1,NF2)(N1,N2)
 CALCULATE(N1,NF1,N2,NF2)
 EXAMINE
 ROTATE(LF4,LF3,NF1,NF2)(N1,N2)
 CALCULATE(N1,NF1,N2,NF2)
 LOOP
4900 ROTATE(LF4,LF3,NF1,NF2)(N1,N2)
```

```
      DO 4901 NK=1,NDE
4901  OY(NK,N2)=OY(NK,N1)+STEP*(23.*OY(NK,NF1)-16.*OY(NK,LF3)+5.*OY(NK,L
     1F4))/12.
      OY(NK,NF2)=FUNCTION(OY(NK,N2))
      DO 4902 NK=1,NDE
4902  OY(NK,N2)=OY(NK,N1)+STEP*(5.*OY(NK,NF2)+8.*OY(NK,NF1)-OY(NK,LF3))/
     112.
      OY(NK,NF2)=FUNCTION(OY(NK,N2))
      END


       RUNGE-KUTTA-MERSON.
       ********************

      USE(RKM)
      METHOD(RKM)
      ORKMT=.000001
      OY(NK,NF2) = FUNCTION(OY(NK,N2))
      LOOP
4800  ROTATE(N1,N2)(NF1,NF2)
4801  ALLOT(MP,MP2,MP3,MP4,MP5)
4854  CONTINUE
      DO 4802 NK = 1,NDE
4802  OY(NK,MP) = OY(NK,N1)+STEP*(OY(NK,NF1))/3.
      OY(NK,MP2) = FUNCTION(OY(NK,MP))
      DO 4803 NK = 1,NDE
4803  OY(NK,MP) = OY(NK,N1)+STEP*(OY(NK,NF1)+OY(NK,MP2))/6.
      OY(NK,MP3) = FUNCTION(OY(NK,MP))
      DO 4804 NK = 1,NDE
4804  OY(NK,MP) = OY(NK,N1)+.125*STEP*(OY(NK,NF1)+3.*OY(NK,MP3))
      OY(NK,MP4) = FUNCTION(OY(NK,MP))
      DO 4805 NK = 1,NDE
4805  OY(NK,MP) = OY(NK,N1)+.5*STEP*(OY(NK,NF1)-3.*OY(NK,MP3)
     1 +4.*OY(NK,MP4))
      OY(NK,MP5) = FUNCTION(OY(NK,MP))
      DO 4806 NK = 1,NDE
4806  OY(NK,N2) = OY(NK,N1)+STEP*(OY(NK,NF1)+4.*OY(NK,MP4)+OY(NK,MP5))
     1 /6.
      OY(NK,NF2) = FUNCTION(OY(NK,N2))
      IF(NV.NE.0) GO TO 4851
```

```
      MDBL = 0
      MHLV = 0
      DO 4850 NK=1,NDE
      DEPS=(DY(NK,NF1)-4.5*DY(NK,MP3)+4.*DY(NK,MP4)-.5*DY(NK,MP5))/15.
      DEPS=ABS(DEPS)
      IF(DEPS.GT.DRKMT) MHLV = 1
      IF(48.0*DEPS.GT.DRKMT) MDBL = 1
4850  CONTINUE
      IF(MHLV.EQ.0) GO TO 4852
      STEP=.5*STEP
      WRITE(6,4853) STEP,DY(1,N1)
4853  FORMAT(18H  STEP HALVED TO  E14.7,4H AT E14.7)
      GO TO 4854
4852  IF (MDBL.EQ.1) GO TO 4851
      STEP=2.*STEP
      WRITE(6,4855) STEP,DY(1,N1)
4855  FORMAT(18H  STEP DOUBLED TO E14.7,4H AT E14.7)
      GO TO 4854
4851  CONTINUE
      RESTORE(MP,MP2,MP3,MP4,MP5)
      END


       FIFTH ORDER GAUSSIAN QUADRATURE.
       ********************************

      USE(GAUSS5)
      METHOD(GAUSS5)
      DIMENSION MG1(5),MG2(5)
      MG1(1)=.23692689
      MG1(2)=.47862867
      MG1(3)=.56888888
      MG1(4)=MG1(2)
      MG1(5)=MG1(1)
      MG2(1)=-.90617985
      MG2(2)=-.53846931
      MG2(3)=0.0
      MG2(4)=-MG2(2)
      MG2(5)=-MG2(1)
      DY(NK,NF2)=FUNCTION(DY(NK,N2))
```

```
      LOOP
4800  ROTATE(N1,N2) (NF1,NF2)
4801  ALLOT(MP,MQ,MZ)
      DO 4802 NK=1,NDE
4802  DY(NK,MP)=0.0
      DO 4803 ML=1,5
      DO 4803 NK=1,NDE
      DY(NK,MQ)=.5*STEP*MG2(ML)+(DY(NK,N1)+.5*STEP)
      DY(NK,MZ)=FUNCTION(DY(NK,MQ))
4803  DY(NK,MP)=DY(NK,MP)+MG1(ML)*DY(NK,MZ)
      DO 4804 NK=1,NDE
4804  DY(NK,N2)=DY(NK,N1)+.5*STEP*DY(NK,MP)
      RESTORE(MP,MQ,MZ)
      DY(NK,NF2)=FUNCTION(DY(NK,N2))
      END
```

APPENDIX 5

LISTING OF DEMON

The DEMON programme consists of two chains. The first chain consists of three decks :

1. AMBDMN, COBOL (cards 1 – 2341)
2. AMEDAT, MAP (2342 – 2384)
3. DMN NMD, MAP (2385 – 2392)

The second chain consists of one deck :

1. DMN AMB, COBOL (2393 – 6020)

Some subroutines occur in both COBOL programmes.

The data divisions of the two COBOL programmes are identical. When chain 1 is finished, the data division is dumped onto tape (989 – 1004) and an assembly language programme (1006 – 1008, 2385 – 2392) causes the second chain to be loaded. The data division is then read back from the tape. (2765 – 2777)

A comment card giving the date of generation is produced in the first COBOL programme. The cards which produce this (376 – 397, 2342 – 2384) may be deleted.

Standard options may be changed. These are as follows :

1. The width of output from the FORTRAN execution (that is, CPL card) (204).
2. The name of the implicit variable (350).
3. The standard FILE card (596 – 597).
4. The standard OUTPUT card (604).

Part of the programme is concerned with the IBM – IBSYS monitor, which uses cards with a dollar character in column one. In particular the card

$ IBSYS

recalls the monitor and usually signifies the end of a job.

DEMON has to read and store control cards which, together with the generated programme, will be used later to form an input tape. However the dollar character is also used as an end of record indicator in the storage subroutine. For this reason a dollar character in column one on input cards is replaced by a comma before storing (372, 851). The dollar character is replaced when the cards are retrieved (2808, 4451, 4457).

The '$ IBSYS' card is taken to be the end of the job (855).

A 6 – character field (2783) precedes the output onto tape so that the tape will be accepted later by the monitor as input.

The first card put onto tape (2784 – 2785) becomes a message to the operators.

APPENDIX 5 (Continued)

When all the programme has been generated a card (4462) is put onto tape so that the original configuration will eventually be restored. A card (4465 – 4466) is then left (IBM 1964c, p.81–2) so that the monitor will treat the tape just produced as an input tape.

```
$IBSYS                                                                  DMN0001
$ID         11048                                                       DMN0002
$JOB           0002 N.W.BENNETT                                         DMN0003
$TIME          90                                                       DMN0004
$*             PLEASE DIAL IN TAPE 4.                                   DMN0005
$IBJOB AMBDMN  COBOL,MAP,DECK                                           DMN0006
$IBCBC AMBDMN  DECK,NOLIST                                              DMN0007
       IDENTIFICATION DIVISION.                                         DMN0008
           PROGRAM-ID. DEMON.                                           DMN0009
       ENVIRONMENT DIVISION.                                            DMN0010
       CONFIGURATION SECTION.                                           DMN0011
           SOURCE-COMPUTER. IBM-7040.                                   DMN0012
           OBJECT-COMPUTER. IBM-7040, MEMORY SIZE 32768 WORDS.          DMN0013
       INPUT-OUTPUT SECTION.                                            DMN0014
           FILE-CONTROL. SELECT INFILE, ASSIGN TO IN,                   DMN0015
                   SELECT BINFILE, ASSIGN TO U04, RESERVE NO            DMN0016
                   ALTERNATE AREA,                                      DMN0017
                   SELECT OUTFILE, ASSIGN TO OU.                        DMN0018
       DATA DIVISION.                                                   DMN0019
       FILE SECTION.                                                    DMN0020
           FD INFILE, RECORD CONTAINS 84 CHARACTERS, DATA RECORD IS     DMN0021
           INP, LABEL RECORD IS OMITTED.                                DMN0022
           01 INP.                                                      DMN0023
            02 INCARD.                                                  DMN0024
             03 CD, SIZE IS 1 AN CHARACTER, OCCURS 80 TIMES.            DMN0025
            02 FILLER, SIZE IS 4 AN CHARACTERS.                        DMN0026
           FD BINFILE, RECORD CONTAINS 3000 CHARACTERS, DATA RECORD IS  DMN0027
           BINOUT, RECORDING MODE IS BINARY, LABEL RECORD IS OMITTED.   DMN0028
           01 BINOUT.                                                   DMN0029
            02 BINN, SIZE IS 4 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT, DMN0030
                   OCCURS 500 TIMES.                                    DMN0031
           FD OUTFILE, RECORD CONTAINS 132 CHARACTERS, DATA RECORD IS   DMN0032
           OUT, LABEL RECORD IS OMITTED.                                DMN0033
           01 OUT.                                                      DMN0034
            02 FILLER, SIZE IS 2 AN CHARACTERS.                        DMN0035
            02 OUTCARD.                                                DMN0036
             03 DC, SIZE IS 1 AN CHARACTER, OCCURS 80 TIMES.           DMN0037
            02 FILLER, SIZE IS 50 AN CHARACTERS.                       DMN0038
       WORKING-STORAGE SECTION.                                         DMN0039
           01 BINPT, SIZE IS 6 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0040
```

```
01 DATPT, SIZE IS 6 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0041
01 DAT-DAT.                                                  DMN0042
 02 DAT, SIZE IS 4 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT, DMN0043
       OCCURS 2 TIMES.                                       DMN0044
01 ZORRO, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0045
01 GSNU1, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT. DMN0046
01 SAPT, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0047
01 ADR, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0048
01 ADRC, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0049
01 ADRD, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0050
01 NR5, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0051
01 TBPT,  SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0052
01 TBPT2, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0053
01 TMPT,  SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0054
01 DPT2,  SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0055
01 IFPT,  SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0056
01 IFPT2, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0057
01 FXD, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN0058
       88 FIXED-POINT, VALUE IS 1.                           DMN0059
01 DIO, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN0060
01 NM,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0061
01 RNM,   SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0062
01 RNM2,  SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0063
01 RDS, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN0064
01 CDPT,  SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0065
01 CNPT,  SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0066
01 CNPT2, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0067
01 CNPT4, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0068
01 BC, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,   DMN0069
       SIGNED.                                               DMN0070
01 EQ, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.    DMN0071
01 NO-GO, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT. DMN0072
01 EQBC, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.  DMN0073
01 EQCM, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.  DMN0074
01 NCPC, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0075
01 NF,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0076
01 NPC,  SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0077
01 GNFFF, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0078
01 FMPTR, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT. DMN0079
01 GNFU1, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT. DMN0080
```

```
01 TEMP-REG, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED      DMN0081
      RIGHT.                                                   DMN0082
01 PERM-REG, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED      DMN0083
      RIGHT.                                                   DMN0084
01 OP-COUNT, SIZE 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0085
01 DFIVE, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0086
01 DSC-FND, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED        DMN0087
       RIGHT.                                                  DMN0088
01 FNCDG, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN0089
       88 FNC, VALUE IS 1.                                     DMN0090
01 FDX, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.     DMN0091
01 BC2, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN0092
01 CNPT3, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0093
01 DCPT,  SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0094
01 NT, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.      DMN0095
      88 NUMBER, VALUE IS 1.                                   DMN0096
      88 ALPHA, VALUE IS 2.                                    DMN0097
01 PHASEND, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED        DMN0098
      RIGHT.                                                   DMN0099
      88 END-OF-PHASE, VALUE IS 1.                             DMN0100
01 PNU,   SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN0101
01 PNU1,  SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN0102
01 P1,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0103
01 P2,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0104
01 P3,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0105
01 P4,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0106
01 P5,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0107
01 N, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.      DMN0108
01 POINTER.                                                    DMN0109
 02 PT,  SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,   DMN0110
      OCCURS 30 TIMES.                                         DMN0111
01 PERM1, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0112
01 PERM2, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0113
01 TEMP1, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0114
01 TEMP2, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN0115
01 DATAD, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED         DMN0116
      RIGHT, VALUE IS 0.                                       DMN0117
01 FILLY-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED        DMN0118
      RIGHT, VALUE IS 0.                                       DMN0119
01 CCC, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,     DMN0120
```

```
          VALUE IS 0.                                                    DMN0121
      01 SENM, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,       DMN0122
          VALUE IS 0.                                                    DMN0123
      01 LIST-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED             DMN0124
          RIGHT, VALUE IS 0.                                             DMN0125
      01 DECK-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED             DMN0126
          RIGHT, VALUE IS 0.                                             DMN0127
      01 TAPE-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED             DMN0128
          RIGHT, VALUE IS 1.                                             DMN0129
      01 DUMP-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED             DMN0130
          RIGHT, VALUE IS 0.                                             DMN0131
      01 FUNCTION-CARDS-CODE, SIZE IS 2 COMPUTATIONAL DIGIT,             DMN0132
          SYNCHRONIZED RIGHT, VALUE IS 01.                               DMN0133
      01 DIM-CODE, SIZE IS 2 COMPUTATIONAL DIGIT,                        DMN0134
          SYNCHRONIZED RIGHT, VALUE IS 02.                               DMN0135
      01 DO-TABLE-CODE, SIZE IS 2 COMPUTATIONAL DIGIT,                   DMN0136
          SYNCHRONIZED RIGHT, VALUE IS 03.                               DMN0137
      01 SYMBOL-TABLE-CODE, SIZE IS 2 COMPUTATIONAL DIGIT,               DMN0138
          SYNCHRONIZED RIGHT, VALUE IS 04.                               DMN0139
      01 ALTER-CARD-CODE,     SIZE IS 2 COMPUTATIONAL DIGITS,            DMN0140
          SYNCHRONIZED RIGHT, VALUE IS 05.                               DMN0141
      01 BIN-OUT-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED      DMN0142
          RIGHT, VALUE IS 06.                                            DMN0143
      01 BASIC-LIST-CODE,     SIZE IS 2 COMPUTATIONAL DIGITS,            DMN0144
          SYNCHRONIZED RIGHT, VALUE IS 07.                               DMN0145
      01 SUPP-LIST-CODE,      SIZE IS 2 COMPUTATIONAL DIGITS,            DMN0146
          SYNCHRONIZED RIGHT, VALUE IS 08.                               DMN0147
      01 SUB-LIST-CODE, SIZE IS 2 COMPUTATIONAL DIGITS,                  DMN0148
          SYNCHRONIZED RIGHT, VALUE IS 09.                               DMN0149
      01 CONDITION-CODE,      SIZE IS 2 COMPUTATIONAL DIGITS,            DMN0150
          SYNCHRONIZED RIGHT, VALUE IS 10.                               DMN0151
      01 SUB-BC-CODE,         SIZE IS 2 COMPUTATIONAL DIGITS,            DMN0152
          SYNCHRONIZED RIGHT, VALUE IS 11.                               DMN0153
      01 BOUND-EQ-CODE,       SIZE IS 2 COMPUTATIONAL DIGITS,            DMN0154
          SYNCHRONIZED RIGHT, VALUE IS 12.                               DMN0155
      01 METHOD-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED       DMN0156
          RIGHT, VALUE IS 13.                                            DMN0157
      01 TOLERANCE-CODE, SIZE IS 2 COMPUTATIONAL DIGITS,                 DMN0158
          SYNCHRONIZED RIGHT, VALUE IS 14.                               DMN0159
      01 FREQ-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED         DMN0160
```

```
           RIGHT, VALUE IS 15.                                          DMN0161
    01 USE-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN0162
           RIGHT, VALUE IS 16.                                          DMN0163
    01 BCD-OUT-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED       DMN0164
           RIGHT, VALUE IS 17.                                          DMN0165
    01 CGT1-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN0166
           RIGHT, VALUE IS 18.                                          DMN0167
    01 CGT2-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN0168
           RIGHT, VALUE IS 19.                                          DMN0169
    01 CGT3-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN0170
           RIGHT, VALUE IS 20.                                          DMN0171
    01 CGT4-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN0172
           RIGHT, VALUE IS 21.                                          DMN0173
    01 CGT5-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN0174
           RIGHT, VALUE IS 22.                                          DMN0175
    01 CGT6-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN0176
           RIGHT, VALUE IS 23.                                          DMN0177
    01 CGT7-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN0178
           RIGHT, VALUE IS 24.                                          DMN0179
    01 ITERATE-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED       DMN0180
           RIGHT, VALUE IS 25.                                          DMN0181
    01 PRE-CARD-CODE, SIZE IS 2 COMPUTATIONAL DIGITS,                   DMN0182
           SYNCHRONIZED RIGHT, VALUE IS 26.                             DMN0183
    01 POST-CARD-CODE, SIZE IS 2 COMPUTATIONAL DIGITS,                  DMN0184
           SYNCHRONIZED RIGHT, VALUE IS 27.                             DMN0185
    01 REL-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN0186
           RIGHT, VALUE IS 28.                                          DMN0187
    01 XACT-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN0188
           RIGHT, VALUE IS 29.                                          DMN0189
    01 LIN-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN0190
           RIGHT, VALUE IS 30.                                          DMN0191
    01 INTERP, PICTURE IS 9, VALUE IS 0.                                DMN0192
    01 X-FOUND, PICTURE IS 9, VALUE IS 0.                               DMN0193
    01 L-FOUND, PICTURE IS 9, VALUE IS 0.                               DMN0194
    01 ITE-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,        DMN0195
           VALUE IS 0.                                                  DMN0196
    01 TOL-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,        DMN0197
           VALUE IS 0.                                                  DMN0198
    01 UZED, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,        DMN0199
           VALUE IS 0.                                                  DMN0200
```

```
01 AVAILABLE-SNM, SIZE IS 5 COMPUTATIONAL DIGITS,                DMN0201
       SYNCHRONIZED RIGHT, VALUE IS 04400.                       DMN0202
01 CHPL, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN0203
       VALUE IS 00132.                                           DMN0204
01 BCC, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED             DMN0205
       RIGHT, VALUE IS 00000.                                    DMN0206
01 BASD, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN0207
       VALUE IS 0.                                               DMN0208
01 SUPD, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN0209
       VALUE IS 0.                                               DMN0210
01 FRED, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN0211
       VALUE IS 0.                                               DMN0212
01 PAD,  SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN0213
       VALUE IS 0.                                               DMN0214
01 SHFT, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN0215
       VALUE IS 0.                                               DMN0216
01 SUBNM, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN0217
       RIGHT, VALUE IS 00000.                                    DMN0218
01 COND-NM, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED         DMN0219
       RIGHT, VALUE IS 00003.                                    DMN0220
01 BC-NM, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,    DMN0221
       VALUE IS 00000.                                           DMN0222
01 ARRAY-NM, SIZE IS 5 COMPUTATIONAL DIGITS,                     DMN0223
       SYNCHRONIZED RIGHT, VALUE IS 00002.                       DMN0224
01 NOBD, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,      DMN0225
       VALUE IS 0.                                               DMN0226
01 ALLD, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,      DMN0227
       VALUE IS 0.                                               DMN0228
01 NOSD, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,      DMN0229
       VALUE IS 0.                                               DMN0230
01 PTE, SIZE IS 5 COMPUTATIONAL DIGITS,                          DMN0231
       SYNCHRONIZED RIGHT, VALUE IS 00000.                       DMN0232
01 STORE-SIZE, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED      DMN0233
       RIGHT, VALUE IS 15000.                                    DMN0234
01 NTER,  SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN0235
01 NTER2, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN0236
01 NEW-AREA, SIZE IS 960 AN CHARACTERS.                          DMN0237
01 PET.                                                          DMN0238
 02 PTS, PICTURE IS 9, OCCURS 5 TIMES.                           DMN0239
01 PT    SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.     DMN0240
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01 TRANSFER.                                                          DMN0241
 02 STA, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,          DMN0242
       OCCURS 30 TIMES.                                               DMN0243
01 SAT.                                                               DMN0244
 02 SATS, PICTURE IS 9, OCCURS 5 TIMES.                               DMN0245
01 OUT-POINTER.                                                       DMN0246
 02 STP, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,          DMN0247
       OCCURS 30 TIMES.                                               DMN0248
01 PTR,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.        DMN0249
01 PRE,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.        DMN0250
01 INCR,  SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.        DMN0251
01 T,     SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.        DMN0252
01 D5,    SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.        DMN0253
01 NCT, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.         DMN0254
01 NM5,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.       DMN0255
01 CAPT, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.        DMN0256
01 CARD-AREA.                                                         DMN0257
 02 CA,  PICTURE IS X, OCCURS 960 TIMES.                              DMN0258
01 ROB1, SIZE IS 6 AN CHARACTERS, SYNCHRONIZED RIGHT.                DMN0259
01 ROB2, SIZE IS 6 AN CHARACTERS, SYNCHRONIZED RIGHT.                DMN0260
01 ROB3.                                                              DMN0261
 02 RBO, SIZE IS 1 AN CHARACTER, OCCURS 6 TIMES.                      DMN0262
01 DELAY-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED              DMN0263
       RIGHT, VALUE IS 0.                                             DMN0264
01 DELAY-D1, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED             DMN0265
       RIGHT, VALUE IS 0.                                             DMN0266
01 OUTCARD1.                                                          DMN0267
 02 DC1, SIZE IS 1 AN CHARACTER, OCCURS 80 TIMES.                     DMN0268
01 OUTCARD2, SIZE IS 80 AN CHARACTERS.                               DMN0269
01 CALOOK.                                                            DMN0270
 02 CAL, PICTURE IS X, OCCURS 5 TIMES.                                DMN0271
01 DSN.                                                               DMN0272
 02 DS, PICTURE IS X, OCCURS 5 TIMES.                                 DMN0273
01 AL5.                                                               DMN0274
 02 A5, PICTURE IS X, OCCURS 5 TIMES.                                 DMN0275
01 SENMA.                                                             DMN0276
 02 SENMA1, PICTURE IS X, OCCURS 5 TIMES.                             DMN0277
01 DIDG, PICTURE IS X.                                               DMN0278
01 Z5.                                                                DMN0279
 02 Z1, PICTURE IS X.                                                 DMN0280
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 02 Z4, PICTURE IS XXXX.                                    DMN0281
01 MET-NAME, PICTURE IS XXXXXXXXX.                          DMN0282
01 PC, PICTURE IS X.                                        DMN0283
01 GSP, PICTURE IS X.                                       DMN0284
01 SASA.                                                    DMN0285
 02 SA, PICTURE IS X, OCCURS 72 TIMES.                      DMN0286
01 PP.                                                      DMN0287
 02 PP1, PICTURE IS X.                                      DMN0288
 02 PP2, PICTURE IS X.                                      DMN0289
 02 PP3, PICTURE IS X.                                      DMN0290
 02 PP4, PICTURE IS X.                                      DMN0291
 02 PP5, PICTURE IS X.                                      DMN0292
01 C, PICTURE IS X.                                         DMN0293
01 MTYPE, PICTURE IS X.                                     DMN0294
01 TEST, PICTURE IS XXXXXXXXX.                              DMN0295
01 TEMPORARY.                                               DMN0296
 02 TR,  PICTURE IS X, OCCURS 960 TIMES.                    DMN0297
01 INTERMEDIATE.                                            DMN0298
 02 TM,  PICTURE IS X, OCCURS 960 TIMES.                    DMN0299
01 STORAGE.                                                 DMN0300
 02 ST, PICTURE IS X, OCCURS 15000 TIMES.                   DMN0301
01 REG4.                                                    DMN0302
 02 R4, SIZE IS 1 AN CHARACTER, OCCURS 4 TIMES.             DMN0303
01 B, PICTURE IS X.                                         DMN0304
01 REG3.                                                    DMN0305
 02 R3, SIZE IS 1 AN CHARACTER, OCCURS 3 TIMES.             DMN0306
01 A, SIZE IS 1 AN CHARACTER.                               DMN0307
01 AL, SIZE IS 1 AN CHARACTER.                              DMN0308
01 REG9.                                                    DMN0309
 02 R9, SIZE IS 1 AN CHARACTER, OCCURS 9 TIMES.             DMN0310
01 GER9.                                                    DMN0311
 02 G9, SIZE IS 1 AN CHARACTER, OCCURS 9 TIMES.             DMN0312
01 REG2.                                                    DMN0313
 02 R2, SIZE IS 1 AN CHARACTER, OCCURS 2 TIMES.             DMN0314
01 IFIF.                                                    DMN0315
 02 IFA, PICTURE IS X, OCCURS 960 TIMES.                    DMN0316
01 DO-NUM.                                                  DMN0317
 02 OR-DO.                                                  DMN0318
  03 ORD, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.           DMN0319
 02 NEW-DO.                                                 DMN0320
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          03 NED, PICTURE IS X, OCCURS 5 TIMES.                          DMN0321
         02 DLA, PICTURE IS X, VALUE IS '$'.                             DMN0322
        01 CNCN.                                                         DMN0323
         02 CN,  PICTURE IS X, OCCURS 960 TIMES.                         DMN0324
        01 TABLE-AREA.                                                   DMN0325
         02 TB1.                                                         DMN0326
          03 TBL1, SIZE IS 1 AN CHARACTER, OCCURS 9 TIMES.               DMN0327
         02 TB2.                                                         DMN0328
          03 TBL2, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.               DMN0329
         02 TB3, SIZE IS 1 AN CHARACTER.                                 DMN0330
         02 TBTYPE, PICTURE IS X.                                        DMN0331
         02 TB4.                                                         DMN0332
          03 TBL3, OCCURS 10 TIMES.                                      DMN0333
           04 TBL3S, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.             DMN0334
        01 TABLE-AREA-2.                                                 DMN0335
         02 TZ1.                                                         DMN0336
          03 TZL1, SIZE IS 1 AN CHARACTER, OCCURS 9 TIMES.               DMN0337
         02 TZ2.                                                         DMN0338
          03 TZL2, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.               DMN0339
         02 TZ3, SIZE IS 1 AN CHARACTER.                                 DMN0340
         02 TZTYPE, PICTURE IS X.                                        DMN0341
         02 TZ4.                                                         DMN0342
          03 TZL3, OCCURS 10 TIMES.                                      DMN0343
           04 TZL3S, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.             DMN0344
        01 METHOD1, PICTURE IS XXXXXXXXX.                                DMN0345
        01 METHOD2, PICTURE IS XXXXXXXXX.                                DMN0346
        01 MTYPE1, PICTURE IS X.                                         DMN0347
        01 MTYPE2, PICTURE IS X.                                         DMN0348
        01 INDEPENDENT-VAR.                                              DMN0349
         02 IND, PICTURE IS XXXXXXXXX, VALUE IS 'T        '.            DMN0350
         02 INDF, PICTURE IS XXXXXXXXXXX, VALUE IS '00001IB    $'.       DMN0351
        01 FCONTROL, SIZE IS 48 AN CHARACTERS.                           DMN0352
        01 FREAD, SIZE IS 48 AN CHARACTERS.                              DMN0353
        01 FWRITE.                                                       DMN0354
         02 FWR, PICTURE IS X, OCCURS 48 TIMES.                          DMN0355
        01 ENDD, SIZE IS 4 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.     DMN0356
PROCEDURE DIVISION.                                                     DMN0357
MAIN-LINE SECTION.                                                      DMN0358
ML. OPEN INPUT INFILE, OUTPUT OUTFILE.                                  DMN0359
    MOVE SPACES TO OUT.                                                 DMN0360
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    MOVE '00000' TO DSN.                                              DMN0361
    MOVE 1 TO D5.                                                     DMN0362
ML1. MOVE 00000 TO STA (D5).                                          DMN0363
    ADD 1 TO D5.                                                      DMN0364
    IF D5 NOT GREATER THAN 30 GO TO ML1.                              DMN0365
PHASE1. MOVE 'ENTERDEMO' TO TEST.                                     DMN0366
    PERFORM CONT-READ.                                                DMN0367
PHA1. IF END-OF-PHASE GO TO PHA1A.                                    DMN0368
    PERFORM CONT-READ.                                                DMN0369
    MOVE PRE-CARD-CODE TO N.                                          DMN0370
    MOVE CNCN TO INTERMEDIATE.                                        DMN0371
    IF TM (1) = '$' MOVE ',' TO TM (1).                               DMN0372
    PERFORM PUT-AWAY.                                                 DMN0373
    GO TO PHA1.                                                       DMN0374
PHA1A. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN0375
    MOVE 'C DEMON PROGRAMME GENERATED XXXXXXXXXXXX$          ' TO     DMN0376
         CARD-AREA.                                                   DMN0377
R-DAVIDS-1. ENTER ASSEMBLY-PROGRAM.                                   DMN0378
CALL    DATE(ROB1,ROB2)                                               DMN0379
R-DAVIDS-2. ENTER COBOL.                                              DMN0380
    MOVE ROB1 TO ROB3.                                                DMN0381
    MOVE RBO (1) TO CA (29).                                          DMN0382
    MOVE RBO (2) TO CA (30).                                          DMN0383
    MOVE RBO (3) TO CA (31).                                          DMN0384
    MOVE RBO (4) TO CA (32).                                          DMN0385
    MOVE RBO (5) TO CA (33).                                          DMN0386
    MOVE RBO (6) TO CA (34).                                          DMN0387
    MOVE ROB2 TO ROB3.                                                DMN0388
    MOVE RBO (1) TO CA (35).                                          DMN0389
    MOVE RBO (2) TO CA (36).                                          DMN0390
    MOVE RBO (3) TO CA (37).                                          DMN0391
    MOVE RBO (4) TO CA (38).                                          DMN0392
    MOVE RBO (5) TO CA (39).                                          DMN0393
    MOVE RBO (6) TO CA (40).                                          DMN0394
    MOVE CARD-AREA TO INTERMEDIATE.                                   DMN0395
    MOVE PRE-CARD-CODE TO N.                                          DMN0396
    PERFORM PUT-AWAY.                                                 DMN0397
    MOVE INCARD TO CNCN.                                              DMN0398
    MOVE 0 TO CNPT.                                                   DMN0399
PHA1B. ADD 1 TO CNPT.                                                 DMN0400
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     MOVE CN (CNPT) TO A.                                          DMN0401
     IF A = '$' GO TO PHASE2.                                      DMN0402
     IF A NOT = ',' GO TO PHA1B.                                   DMN0403
PHA1D. PERFORM MET63.                                              DMN0404
     IF REG9 = 'LIST      ' MOVE 1 TO LIST-D.                      DMN0405
     IF REG9 = 'DECK      ' MOVE 1 TO DECK-D.                      DMN0406
     IF REG9 = 'NOTAPE    ' MOVE 0 TO TAPE-D.                      DMN0407
     IF REG9 = 'DUMP      ' MOVE 1 TO DUMP-D.                      DMN0408
     IF A NOT = '$' GO TO PHA1D.                                   DMN0409
PHASE2. MOVE 'FUNCTION ' TO TEST.                                  DMN0410
     PERFORM CONT-READ.                                            DMN0411
     MOVE CNCN TO INTERMEDIATE.                                    DMN0412
     MOVE 'C' TO TM (1).                                           DMN0413
     MOVE '$' TO TM (73).                                          DMN0414
     MOVE PRE-CARD-CODE TO N.                                      DMN0415
     PERFORM PUT-AWAY.                                             DMN0416
PHA2. IF END-OF-PHASE GO TO PHASE3.                                DMN0417
     PERFORM CONT-READ.                                            DMN0418
     MOVE CNCN TO INTERMEDIATE.                                    DMN0419
     MOVE 'C' TO TM (1).                                           DMN0420
     MOVE '$' TO TM (73).                                          DMN0421
     MOVE PRE-CARD-CODE TO N.                                      DMN0422
     PERFORM PUT-AWAY.                                             DMN0423
     PERFORM SCAN-CARD.                                            DMN0424
     IF EQBC = 1 AND EQ = 0 GO TO COND.                            DMN0425
     IF EQBC = 1 AND EQ = 1 GO TO BOUNDEQ.                         DMN0426
     IF EQBC = 0 AND EQ = 1 GO TO PHA2.                            DMN0427
     IF REG3 = 'IMP' GO TO INDEP.                                  DMN0428
     IF REG3 = 'INT' GO TO TERP.                                   DMN0429
     IF REG3 = 'IND' GO TO DEPIN.                                  DMN0430
     IF REG3 = 'ALT' GO TO ALT.                                    DMN0431
     IF REG3 = 'OUT' GO TO OAT.                                    DMN0432
     IF REG3 = 'BAS' GO TO BAS.                                    DMN0433
     IF REG3 = 'SUP' GO TO SUP.                                    DMN0434
     IF REG3 = 'NOB' GO TO NOB.                                    DMN0435
     IF REG3 = 'ALL' GO TO ALZ.                                    DMN0436
     IF REG3 = 'NOO' GO TO NOO.                                    DMN0437
     IF REG3 = 'FRE' GO TO FRE.                                    DMN0438
     IF REG3 = 'MET' GO TO KMET.                                   DMN0439
     IF REG3 = 'USE' GO TO UZE.                                    DMN0440
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        IF REG3 = 'FIL' GO TO FILLY.                              DMN0441
        IF REG3 = 'ITE' GO TO ITE.                                DMN0442
        IF REG3 = 'CPL' GO TO CPL.                                DMN0443
        IF REG3 = 'CHA' GO TO CPL.                                DMN0444
        IF REG3 = 'REL' GO TO RELL.                               DMN0445
        GO TO PHA2.                                               DMN0446
    RELL. MOVE CNCN TO INTERMEDIATE.                              DMN0447
        MOVE REL-CODE TO N.                                       DMN0448
        PERFORM PUT-AWAY.                                         DMN0449
        GO TO PHA2.                                               DMN0450
    DEPIN. MOVE 6 TO CNPT.                                        DMN0451
    DEPIN1. ADD 1 TO CNPT.                                        DMN0452
        MOVE CN (CNPT) TO A.                                      DMN0453
        IF A = '$' GO TO PHA2.                                    DMN0454
        IF A NOT = '(' GO TO DEPIN1.                              DMN0455
        MOVE 1 TO BC.                                             DMN0456
        MOVE 0 TO TMPT.                                           DMN0457
    DEPIN2. ADD 1 TO CNPT.                                        DMN0458
        MOVE CN (CNPT) TO A.                                      DMN0459
        IF A = '(' ADD 1 TO BC.                                   DMN0460
        IF A = ')' SUBTRACT 1 FROM BC.                            DMN0461
        IF BC = 0 GO TO DEPIN3.                                   DMN0462
        ADD 1 TO TMPT.                                            DMN0463
        MOVE A TO TM (TMPT).                                      DMN0464
        GO TO DEPIN2.                                             DMN0465
    DEPIN3. ADD 1 TO TMPT.                                        DMN0466
        MOVE '$' TO TM (TMPT).                                    DMN0467
        MOVE LIN-CODE TO N.                                       DMN0468
        PERFORM PUT-AWAY.                                         DMN0469
        GO TO PHA2.                                               DMN0470
    TERP. MOVE 1 TO INTERP.                                       DMN0471
        GO TO PHA2.                                               DMN0472
    ITE. MOVE 6 TO CNPT.                                          DMN0473
    ITE1. ADD 1 TO CNPT.                                          DMN0474
        MOVE CN (CNPT) TO A.                                      DMN0475
        IF A = '$' GO TO PHA2.                                    DMN0476
        IF A NOT = '(' GO TO ITE1.                                DMN0477
        MOVE 0 TO TMPT.                                           DMN0478
    ITE2. ADD 1 TO CNPT.                                          DMN0479
        ADD 1 TO TMPT.                                            DMN0480
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      MOVE CN (CNPT) TO A.                                          DMN0481
      IF A = ')' GO TO ITE3.                                        DMN0482
      MOVE A TO TM (TMPT).                                          DMN0483
      GO TO ITE2.                                                   DMN0484
 ITE3. MOVE '$' TO TM (TMPT).                                       DMN0485
      MOVE ITERATE-CODE TO N.                                       DMN0486
      PERFORM PUT-AWAY.                                             DMN0487
      MOVE 1 TO ITE-D.                                              DMN0488
      GO TO PHA2.                                                   DMN0489
 CPL. MOVE 6 TO CNPT.                                               DMN0490
 CPL1. ADD 1 TO CNPT.                                               DMN0491
      IF CN (CNPT) NOT = '(' GO TO CPL1.                            DMN0492
      MOVE '00000' TO AL5.                                          DMN0493
 CPL2. ADD 1 TO CNPT.                                               DMN0494
      MOVE CN (CNPT) TO A.                                          DMN0495
      IF A = ')' GO TO CPL3.                                        DMN0496
      MOVE A5 (2) TO A5 (1).                                        DMN0497
      MOVE A5 (3) TO A5 (2).                                        DMN0498
      MOVE A5 (4) TO A5 (3).                                        DMN0499
      MOVE A5 (5) TO A5 (4).                                        DMN0500
      MOVE A TO A5 (5).                                             DMN0501
      GO TO CPL2.                                                   DMN0502
 CPL3. PERFORM AL5-NM5.                                             DMN0503
      MOVE NM5 TO CHPL.                                             DMN0504
      GO TO PHA2.                                                   DMN0505
 FILLY. MOVE 0 TO BC.                                               DMN0506
      MOVE 6 TO CNPT.                                               DMN0507
      PERFORM FLL.                                                  DMN0508
      MOVE FWRITE TO FCONTROL.                                      DMN0509
      PERFORM FLL.                                                  DMN0510
      MOVE FWRITE TO FREAD.                                         DMN0511
      PERFORM FLL.                                                  DMN0512
      MOVE 1 TO FILLY-D.                                            DMN0513
      GO TO PHA2.                                                   DMN0514
 INDEP. MOVE 6 TO CNPT.                                             DMN0515
 IND1. ADD 1 TO CNPT.                                               DMN0516
      MOVE CN (CNPT) TO A.                                          DMN0517
      IF A = '$' GO TO PHA2.                                        DMN0518
      IF A NOT = '(' GO TO IND1.                                    DMN0519
      PERFORM MET63.                                                DMN0520
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           MOVE REG9 TO IND.                                                    DMN0521
           GO TO PHA2.                                                          DMN0522
       KMET. PERFORM INTAKE-METHOD.                                             DMN0523
           GO TO PHASE2.                                                        DMN0524
       NOB. MOVE 1 TO NOBD.                                                     DMN0525
           GO TO PHA2.                                                          DMN0526
       ALZ. MOVE 1 TO ALLD.                                                     DMN0527
           GO TO PHA2.                                                          DMN0528
       NOO. MOVE 1 TO NOOD.                                                     DMN0529
           GO TO PHA2.                                                          DMN0530
       ALT. ADD 1 TO BCC.                                                       DMN0531
           MOVE ALTER-CARD-CODE TO N.                                           DMN0532
       MV. MOVE CNCN TO INTERMEDIATE.                                           DMN0533
           PERFORM PUT-AWAY.                                                    DMN0534
           GO TO PHA2.                                                          DMN0535
       OAT. MOVE 6 TO CNPT.                                                     DMN0536
           MOVE 0 TO BC.                                                        DMN0537
       OAT1. ADD 1 TO CNPT.                                                     DMN0538
           MOVE CN (CNPT) TO A.                                                 DMN0539
           IF A = '$' GO TO PHA2.                                               DMN0540
           IF A NOT = '(' GO TO OAT1.                                           DMN0541
           MOVE BIN-OUT-CODE TO N.                                              DMN0542
           MOVE ' ' TO TM (1), TM (2), TM (3), TM (4), TM (5), TM (6).          DMN0543
           MOVE 6 TO PTM.                                                       DMN0544
       OAT2. ADD 1 TO CNPT.                                                     DMN0545
           MOVE CN (CNPT) TO A.                                                 DMN0546
           IF A = ')' AND BC = 0 GO TO OAT3.                                    DMN0547
           IF A = ')' SUBTRACT 1 FROM BC.                                       DMN0548
           IF A = '(' ADD 1 TO BC.                                              DMN0549
           IF A = '*' MOVE BCD-OUT-CODE TO N.                                   DMN0550
           ADD 1 TO PTM.                                                        DMN0551
           MOVE A TO TM (PTM).                                                  DMN0552
           GO TO OAT2.                                                          DMN0553
       OAT3. ADD 1 TO PTM.                                                      DMN0554
           MOVE '$' TO TM (PTM).                                                DMN0555
           PERFORM PUT-AWAY.                                                    DMN0556
           GO TO OAT1.                                                          DMN0557
       BAS. MOVE 1 TO BASD.                                                     DMN0558
           MOVE BASIC-LIST-CODE TO N.                                           DMN0559
           GO TO MV.                                                            DMN0560
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SUP. MOVE 1 TO SUPD.                                                    DMN0561
     MOVE SUPP-LIST-CODE TO N.                                          DMN0562
     GO TO MV.                                                          DMN0563
UZE. MOVE 1 TO UZED.                                                    DMN0564
     MOVE USE-CODE TO N.                                                DMN0565
     GO TO MV.                                                          DMN0566
FRE. MOVE 6 TO CNPT.                                                    DMN0567
FREQ1. ADD 1 TO CNPT.                                                   DMN0568
     MOVE CN (CNPT) TO A.                                               DMN0569
     IF A = '$' GO TO PHA2.                                             DMN0570
     IF A NOT = '(' GO TO FREQ1.                                        DMN0571
     MOVE 0 TO TMPT.                                                    DMN0572
     MOVE 0 TO FDX.                                                     DMN0573
FREQ2. ADD 1 TO CNPT.                                                   DMN0574
     ADD 1 TO TMPT.                                                     DMN0575
     MOVE CN (CNPT) TO A.                                               DMN0576
     IF A = ')' GO TO FREQ3.                                            DMN0577
     IF A = '.' MOVE 1 TO FDX.                                          DMN0578
     IF A = 'E' MOVE 1 TO FDX.                                          DMN0579
     MOVE A TO TM (TMPT).                                               DMN0580
     GO TO FREQ2.                                                       DMN0581
FREQ3. MOVE '$' TO TM (TMPT).                                           DMN0582
     MOVE TM (1) TO B.                                                  DMN0583
     PERFORM ATEST.                                                     DMN0584
     IF NOT ALPHA GO TO FREQN.                                          DMN0585
     MOVE B TO A.                                                       DMN0586
     PERFORM FIXED-POINT-TEST.                                          DMN0587
     IF FIXED-POINT MOVE 0 TO FDX.                                      DMN0588
     IF NOT FIXED-POINT MOVE 1 TO FDX.                                  DMN0589
FREQN. MOVE 1 TO FRED.                                                  DMN0590
     MOVE FREQ-CODE TO N.                                               DMN0591
     PERFORM PUT-AWAY.                                                  DMN0592
     GO TO PHA2.                                                        DMN0593
PHASE3. MOVE 'ENDDEMON ' TO TEST.                                       DMN0594
     IF FILLY-D = 1 GO TO ABC6.                                         DMN0595
     MOVE '      FILE(REWIND 0)(READ(0))(WRITE(0))$          ' TO       DMN0596
          CNCN.                                                         DMN0597
     GO TO FILLY.                                                       DMN0598
ABC6. MOVE ZERO TO ZORRO, NOTE NO-OP.                                   DMN0599
     MOVE BCD-OUT-CODE TO N.                                            DMN0600
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      MOVE 1 TO PNU.                                                    DMN0601
      PERFORM UNPACK.                                                   DMN0602
      IF PNU1 NOT = 1 GO TO OAT4.                                       DMN0603
      MOVE '      WRITE (6,*)$      ' TO INTERMEDIATE.                  DMN0604
      PERFORM PUT-AWAY.                                                 DMN0605
OAT4. MOVE ZERO TO ZORRO, NOTE NO-OP.                                   DMN0606
      MOVE INDEPENDENT-VAR TO INTERMEDIATE.                             DMN0607
      MOVE SYMBOL-TABLE-CODE TO N.                                      DMN0608
      PERFORM PUT-AWAY.                                                 DMN0609
      MOVE INDEPENDENT-VAR TO TABLE-AREA.                               DMN0610
      MOVE TBL1 (8) TO TBL1 (9).                                        DMN0611
      MOVE TBL1 (7) TO TBL1 (8).                                        DMN0612
      MOVE TBL1 (6) TO TBL1 (7).                                        DMN0613
      MOVE TBL1 (5) TO TBL1 (6).                                        DMN0614
      MOVE TBL1 (4) TO TBL1 (5).                                        DMN0615
      MOVE TBL1 (3) TO TBL1 (4).                                        DMN0616
      MOVE TBL1 (2) TO TBL1 (3).                                        DMN0617
      MOVE TBL1 (1) TO TBL1 (2).                                        DMN0618
      MOVE 'D' TO TBL1 (1).                                             DMN0619
      MOVE 'S' TO TBTYPE.                                               DMN0620
      MOVE TABLE-AREA TO INTERMEDIATE.                                  DMN0621
      PERFORM PUT-AWAY.                                                 DMN0622
      PERFORM CONT-READ.                                                DMN0623
      MOVE CNCN TO INTERMEDIATE.                                        DMN0624
      MOVE 'C' TO TM (1).                                               DMN0625
      MOVE '$' TO TM (73).                                              DMN0626
      MOVE PRE-CARD-CODE TO N.                                          DMN0627
      PERFORM PUT-AWAY.                                                 DMN0628
PHA3. IF END-OF-PHASE GO TO PHASE4.                                     DMN0629
      PERFORM CONT-READ.                                                DMN0630
      MOVE CNCN TO INTERMEDIATE.                                        DMN0631
      MOVE 'C' TO TM (1).                                               DMN0632
      MOVE '$' TO TM (73).                                              DMN0633
      MOVE PRE-CARD-CODE TO N.                                          DMN0634
      PERFORM PUT-AWAY.                                                 DMN0635
      PERFORM SCAN-CARD.                                                DMN0636
      MOVE 1 TO PAD.                                                    DMN0637
      MOVE 1 TO SHFT.                                                   DMN0638
      IF EQ = 0 AND REG3 = 'DIM' PERFORM DIM-CARD.                      DMN0639
      IF EQCM = 1 AND R3 (1) = 'D' AND R3 (2) = 'O' PERFORM             DMN0640
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                DO-PROCESS.                                              DMN0641
        IF EQ = 1 AND EQCM = 0 AND REG3 = 'IF(' PERFORM IFCARD.          DMN0642
        IF EQ = 1 AND EQCM = 0 PERFORM DE-CARD.                          DMN0643
        IF PAD = 0 GO TO PHA3.                                           DMN0644
        IF SHFT = 0 GO TO PHA31.                                         DMN0645
        MOVE CNCN TO INTERMEDIATE.                                       DMN0646
PHA31. MOVE FUNCTION-CARDS-CODE TO N.                                    DMN0647
        PERFORM PUT-AWAY.                                                DMN0648
        GO TO PHA3.                                                      DMN0649
PHASE4. MOVE ZERO TO ZORRO, NOTE NO-OP.                                  DMN0650
        MOVE INCARD TO INTERMEDIATE.                                     DMN0651
        MOVE 'C' TO TM (1).                                              DMN0652
        MOVE '$' TO TM (73).                                             DMN0653
        MOVE PRE-CARD-CODE TO N.                                         DMN0654
        PERFORM PUT-AWAY.                                                DMN0655
ML99. MOVE '00000' TO DSN.                                               DMN0656
        IF BCC = 0 GO TO ML99A.                                          DMN0657
        MOVE 'C  NO OF BDY-EQNS NOT = NO OF ALTER CARDS       ' TO       DMN0658
                OUTCARD.                                                 DMN0659
        PERFORM WRITE-OUT.                                               DMN0660
        GO TO UNUSUAL-END.                                               DMN0661
ML99A. PERFORM LOAD-STANDARD-METHOD.                                     DMN0662
        MOVE BC-NM TO BCC.                                               DMN0663
        MOVE USE-CODE TO N.                                              DMN0664
        IF UZED NOT = 1 GO TO PH41.                                      DMN0665
PX. MOVE '      USE(RK2)$          ' TO INTERMEDIATE.                    DMN0666
        PERFORM PUT-AWAY.                                                DMN0667
PH41. MOVE 1 TO PNU.                                                     DMN0668
        PERFORM UNPACK.                                                  DMN0669
        MOVE TEMPORARY TO CNCN.                                          DMN0670
        MOVE 6 TO CNPT.                                                  DMN0671
PH42. ADD 1 TO CNPT.                                                     DMN0672
        MOVE CN (CNPT) TO A.                                             DMN0673
        IF A = '$' GO TO PX.                                             DMN0674
        IF A NOT = '(' GO TO PH42.                                       DMN0675
        PERFORM MET63.                                                   DMN0676
        PERFORM LOOK-UP-METHOD.                                          DMN0677
        MOVE REG9 TO METHOD1.                                            DMN0678
        MOVE MTYPE TO MTYPE1.                                            DMN0679
        MOVE PERM-REG TO PERM1.                                          DMN0680
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    MOVE TEMP-REG TO TEMP1.                                    DMN0681
PH44. ADD 1 TO CNPT.                                           DMN0682
    MOVE CN (CNPT) TO A.                                       DMN0683
    IF A = '$' GO TO PH441.                                    DMN0684
    IF A NOT = '(' GO TO PH44.                                 DMN0685
    PERFORM MET63.                                             DMN0686
PH45. PERFORM LOOK-UP-METHOD.                                  DMN0687
    MOVE REG9 TO METHOD2.                                      DMN0688
    MOVE MTYPE TO MTYPE2.                                      DMN0689
    MOVE PERM-REG TO PERM2.                                    DMN0690
    MOVE TEMP-REG TO TEMP2.                                    DMN0691
    GO TO PH46.                                                DMN0692
PH441. MOVE USE-CODE TO N.                                     DMN0693
    PERFORM UNPACK.                                            DMN0694
    IF PNU1 = 1 GO TO PH442.                                   DMN0695
    MOVE TEMPORARY TO CNCN.                                    DMN0696
    MOVE 6 TO CNPT.                                            DMN0697
PH4415. ADD 1 TO CNPT.                                         DMN0698
    MOVE CN (CNPT) TO A.                                       DMN0699
    IF A = '$' GO TO PH442.                                    DMN0700
    IF A NOT = '(' GO TO PH4415.                               DMN0701
    SUBTRACT 1 FROM CNPT.                                      DMN0702
    GO TO PH44.                                                DMN0703
PH442. MOVE 'RK2       ' TO REG9.                              DMN0704
    GO TO PH45.                                                DMN0705
PH46. IF MTYPE1 = 'R' MOVE MTYPE2 TO MTYPE.                    DMN0706
    IF MTYPE1 NOT = 'P' GO TO PH461.                           DMN0707
    IF MTYPE2 NOT = 'R' GO TO PH461.                           DMN0708
    MOVE METHOD1 TO REG9.                                      DMN0709
    MOVE METHOD2 TO METHOD1.                                   DMN0710
    MOVE REG9 TO METHOD2.                                      DMN0711
    MOVE MTYPE1 TO MTYPE.                                      DMN0712
    MOVE MTYPE2 TO MTYPE1.                                     DMN0713
    MOVE MTYPE TO MTYPE2.                                      DMN0714
    MOVE PERM1 TO PERM-REG.                                    DMN0715
    MOVE PERM2 TO PERM1.                                       DMN0716
    MOVE PERM-REG TO PERM2.                                    DMN0717
    MOVE TEMP1 TO TEMP-REG.                                    DMN0718
    MOVE TEMP2 TO TEMP1.                                       DMN0719
    MOVE TEMP-REG TO TEMP2.                                    DMN0720
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      GO TO PH46.                                                    DMN0721
PH461. IF MTYPE1 = 'P' AND MTYPE2 = 'P' GO TO PH442.                 DMN0722
      IF MTYPE = 'P' GO TO PH462.                                    DMN0723
      MOVE 00000 TO PERM2.                                           DMN0724
      MOVE 00000 TO TEMP2.                                           DMN0725
PH462. COMPUTE PERM-REG = PERM1 + PERM2.                             DMN0726
      MOVE TEMP1 TO TEMP-REG.                                        DMN0727
      IF TEMP2 GREATER THAN TEMP1 MOVE TEMP2 TO TEMP-REG.            DMN0728
      MOVE 0 TO CNPT4.                                               DMN0729
      MOVE '0' TO TM (1).                                            DMN0730
      MOVE '4' TO TM (2).                                            DMN0731
      MOVE '1' TO TM (3).                                            DMN0732
      MOVE '2' TO TM (4).                                            DMN0733
      MOVE '4' TO TM (5).                                            DMN0734
      MOVE 5 TO PTM.                                                 DMN0735
ALL1. IF CNPT4 = BCC GO TO ALL2.                                     DMN0736
      ADD 1 TO CNPT4.                                                DMN0737
      PERFORM AVA-INT.                                               DMN0738
      GO TO ALL1.                                                    DMN0739
ALL2. MOVE CGT1-CODE TO N.                                           DMN0740
      ADD 1 TO PTM.                                                  DMN0741
      MOVE '$' TO TM (PTM).                                          DMN0742
      PERFORM PUT-AWAY.                                              DMN0743
      MOVE 0 TO CNPT4.                                               DMN0744
      MOVE 0 TO PTM.                                                 DMN0745
CNDD1. IF CNPT4 = COND-NM GO TO CNDD2.                               DMN0746
      ADD 1 TO CNPT4.                                                DMN0747
      PERFORM AVA-INT.                                               DMN0748
      GO TO CNDD1.                                                   DMN0749
CNDD2. MOVE CGT2-CODE TO N.                                          DMN0750
      ADD 1 TO PTM.                                                  DMN0751
      MOVE '$' TO TM (PTM).                                          DMN0752
      PERFORM PUT-AWAY.                                              DMN0753
      MOVE 0 TO CNPT4.                                               DMN0754
      MOVE 0 TO PTM.                                                 DMN0755
CNDD3. IF CNPT4 = COND-NM GO TO CNDD4.                               DMN0756
      ADD 1 TO CNPT4.                                                DMN0757
      PERFORM AVA-INT.                                               DMN0758
      GO TO CNDD3.                                                   DMN0759
CNDD4. MOVE CGT3-CODE TO N.                                          DMN0760
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           IF FRED = 1 AND FDX = 1 GO TO CNDD44.                    DMN0761
           GO TO CNDD45.                                            DMN0762
       CNDD44. ADD 1 TO PTM.                                        DMN0763
           MOVE '0' TO TM (PTM).                                    DMN0764
           ADD 1 TO PTM.                                            DMN0765
           MOVE '4' TO TM (PTM).                                    DMN0766
           ADD 1 TO PTM.                                            DMN0767
           MOVE '1' TO TM (PTM).                                    DMN0768
           ADD 1 TO PTM.                                            DMN0769
           MOVE '7' TO TM (PTM).                                    DMN0770
           ADD 1 TO PTM.                                            DMN0771
           MOVE '0' TO TM (PTM).                                    DMN0772
       CNDD45. ADD 1 TO PTM.                                        DMN0773
           MOVE '$' TO TM (PTM).                                    DMN0774
           PERFORM PUT-AWAY.                                        DMN0775
           MOVE CONDITION-CODE TO N.                                DMN0776
           MOVE 1 TO PNU.                                           DMN0777
           MOVE 0 TO PTM.                                           DMN0778
           MOVE 0 TO CNPT.                                          DMN0779
       CNDD5. PERFORM UNPACK.                                       DMN0780
           IF PNU1 = 1 GO TO CNDD6.                                 DMN0781
           IF TR (1) = 'B' GO TO CNDD7.                             DMN0782
           MOVE TR (3) TO A5 (1).                                   DMN0783
           MOVE TR (4) TO A5 (2).                                   DMN0784
           MOVE TR (5) TO A5 (3).                                   DMN0785
           MOVE TR (6) TO A5 (4).                                   DMN0786
           MOVE TR (7) TO A5 (5).                                   DMN0787
           IF AL5 = '00000' MOVE '04108' TO AL5.                    DMN0788
       CNDD8. ADD 1 TO PTM.                                         DMN0789
           MOVE A5 (1) TO TM (PTM).                                 DMN0790
           ADD 1 TO PTM.                                            DMN0791
           MOVE A5 (2) TO TM (PTM).                                 DMN0792
           ADD 1 TO PTM.                                            DMN0793
           MOVE A5 (3) TO TM (PTM).                                 DMN0794
           ADD 1 TO PTM.                                            DMN0795
           MOVE A5 (4) TO TM (PTM).                                 DMN0796
           ADD 1 TO PTM.                                            DMN0797
           MOVE A5 (5) TO TM (PTM).                                 DMN0798
           GO TO CNDD5.                                             DMN0799
       CNDD7. ADD 1 TO AVAILABLE-SNM.                               DMN0800
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           MOVE AVAILABLE-SNM TO AL5.                                    DMN0801
           MOVE A5 (1) TO TR (3).                                        DMN0802
           MOVE A5 (2) TO TR (4).                                        DMN0803
           MOVE A5 (3) TO TR (5).                                        DMN0804
           MOVE A5 (4) TO TR (6).                                        DMN0805
           MOVE A5 (5) TO TR (7).                                        DMN0806
           PERFORM REPLACE.                                              DMN0807
           MOVE 1 TO D5.                                                 DMN0808
       CNDD7A. ADD 1 TO CNPT.                                            DMN0809
           MOVE A5 (D5) TO CN (CNPT).                                    DMN0810
           ADD 1 TO D5.                                                  DMN0811
           IF D5 NOT GREATER THAN 5 GO TO CNDD7A.                        DMN0812
           GO TO CNDD8.                                                  DMN0813
       CNDD6. IF FRED NOT = 1 GO TO CNDD9.                               DMN0814
           IF FDX NOT = 1 GO TO CNDD9.                                   DMN0815
           ADD 1 TO PTM.                                                 DMN0816
           MOVE '0' TO TM (PTM).                                         DMN0817
           ADD 1 TO PTM.                                                 DMN0818
           MOVE '4' TO TM (PTM).                                         DMN0819
           ADD 1 TO PTM.                                                 DMN0820
           MOVE '1' TO TM (PTM).                                         DMN0821
           ADD 1 TO PTM.                                                 DMN0822
           MOVE '3' TO TM (PTM).                                         DMN0823
           ADD 1 TO PTM.                                                 DMN0824
           MOVE '8' TO TM (PTM).                                         DMN0825
       CNDD9. ADD 1 TO PTM.                                              DMN0826
           MOVE '$' TO TM (PTM).                                         DMN0827
           MOVE CGT4-CODE TO N.                                          DMN0828
           PERFORM PUT-AWAY.                                             DMN0829
           ADD 1 TO CNPT.                                                DMN0830
           MOVE '$' TO CN (CNPT).                                        DMN0831
           MOVE CNCN TO INTERMEDIATE.                                    DMN0832
           MOVE SUB-LIST-CODE TO N.                                      DMN0833
           PERFORM PUT-AWAY.                                             DMN0834
       LAST-PHASE. MOVE 'END       ' TO TEST.                            DMN0835
           PERFORM CONT-READ.                                            DMN0836
       LPHA. IF END-OF-PHASE GO TO LPHAAA.                               DMN0837
           PERFORM CONT-READ.                                            DMN0838
           MOVE POST-CARD-CODE TO N.                                     DMN0839
           MOVE CNCN TO INTERMEDIATE.                                    DMN0840
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     PERFORM PUT-AWAY.                                                  DMN0841
     GO TO LPHA.                                                        DMN0842
LPHAAA. MOVE ZERO TO ZORRO, NOTE NO-OP.                                 DMN0843
     MOVE POST-CARD-CODE TO N.                                          DMN0844
     MOVE INCARD TO INTERMEDIATE.                                       DMN0845
     PERFORM PUT-AWAY.                                                  DMN0846
     MOVE ')$                          ' TO INTERMEDIATE.               DMN0847
     PERFORM PUT-AWAY.                                                  DMN0848
NUTHER. PERFORM READ-IN.                                                DMN0849
     MOVE INCARD TO INTERMEDIATE.                                       DMN0850
     IF TM (1) = '$' MOVE ',' TO TM (1).                                DMN0851
     MOVE '$' TO TM (81).                                               DMN0852
     MOVE POST-CARD-CODE TO N.                                          DMN0853
     PERFORM PUT-AWAY.                                                  DMN0854
     IF INCARD NOT = '$IBSYS                    ' GO TO NUTHER.         DMN0855
     IF INTERP = 0 GO TO RAL99.                                         DMN0856
     MOVE 1 TO L-FOUND.                                                 DMN0857
     MOVE 1 TO PNU.                                                     DMN0858
RAL90. MOVE CONDITION-CODE TO N.                                        DMN0859
     PERFORM UNPACK.                                                    DMN0860
     IF PNU1 = 1 GO TO RAL1.                                            DMN0861
     MOVE '$' TO TM (1).                                                DMN0862
     MOVE XACT-CODE TO N.                                               DMN0863
     PERFORM PUT-AWAY.                                                  DMN0864
     GO TO RAL90.                                                       DMN0865
RAL99. MOVE ZERO TO ZORRO, NOTE NO-OP.                                  DMN0866
     MOVE 1 TO PNU.                                                     DMN0867
RAL2. MOVE CONDITION-CODE TO N.                                         DMN0868
     PERFORM UNPACK.                                                    DMN0869
     IF PNU1 - 1 GO TO RAL1.                                            DMN0870
     MOVE TR (9) TO B.                                                  DMN0871
     PERFORM ATEST.                                                     DMN0872
     IF NOT ALPHA GO TO RAL7.                                           DMN0873
     MOVE 8 TO PTR.                                                     DMN0874
     MOVE SPACES TO REG9.                                               DMN0875
RAL4. ADD 1 TO PTR.                                                     DMN0876
     MOVE TR (PTR) TO A.                                                DMN0877
     IF A = ' ' GO TO RAL4.                                             DMN0878
     IF A = '=' GO TO RAL5.                                             DMN0879
     IF A = '(' GO TO RAL6.                                             DMN0880
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      IF A = '+' GO TO RAL7.                                    DMN0881
      IF A = '-' GO TO RAL7.                                    DMN0882
      IF A = '*' GO TO RAL7.                                    DMN0883
      IF A = '/' GO TO RAL7.                                    DMN0884
      IF A = ')' GO TO RAL7.                                    DMN0885
      IF A = '.' GO TO RAL7.                                    DMN0886
      IF A = ',' GO TO RAL7.                                    DMN0887
      IF R9 (1) NOT = ' ' GO TO RAL7.                           DMN0888
      PERFORM R9LEFT.                                           DMN0889
      MOVE A TO R9 (9).                                         DMN0890
      GO TO RAL4.                                               DMN0891
RAL6. ADD 1 TO PTR.                                             DMN0892
      IF TR (PTR) NOT = ')' GO TO RAL6.                         DMN0893
RAL62. ADD 1 TO PTR.                                            DMN0894
      MOVE TR (PTR) TO A.                                       DMN0895
      IF A = ' ' GO TO RAL62.                                   DMN0896
      IF A NOT = '=' GO TO RAL7.                                DMN0897
RAL5. MOVE 1 TO PNU.                                            DMN0898
      MOVE TEMPORARY TO CNCN.                                   DMN0899
      MOVE PTR TO CNPT.                                         DMN0900
      IF REG9 = '←        ' GO TO RAL7.                         DMN0901
      PERFORM R9LEFT-JUSTIFY.                                   DMN0902
RAL51. MOVE SYMBOL-TABLE-CODE TO N.                             DMN0903
      PERFORM UNPACK.                                           DMN0904
      IF PNU1 = 1 GO TO RAL7.                                   DMN0905
      MOVE TEMPORARY TO TABLE-AREA.                             DMN0906
      IF TBTYPE NOT = 'B' GO TO RAL51.                          DMN0907
      IF TB1 NOT = REG9 GO TO RAL51.                            DMN0908
RAL521. MOVE SPACES TO REG9.                                    DMN0909
RAL52. ADD 1 TO CNPT.                                           DMN0910
      MOVE CN (CNPT) TO A.                                      DMN0911
      IF A = ' ' GO TO RAL52.                                   DMN0912
      IF A = '$' GO TO RAL54.                                   DMN0913
      IF A = '+' GO TO RAL54.                                   DMN0914
      IF A = '-' GO TO RAL54.                                   DMN0915
      IF A = '*' GO TO RAL54.                                   DMN0916
      IF A = '/' GO TO RAL54.                                   DMN0917
      IF A = '(' GO TO RAL54.                                   DMN0918
      IF A = ')' GO TO RAL54.                                   DMN0919
      IF A = '.' GO TO RAL54.                                   DMN0920
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      IF A = ',' GO TO RAL54.                                          DMN0921
      IF R9 (1) NOT = ' ' GO TO RAL522.                                DMN0922
      PERFORM R9LEFT.                                                  DMN0923
      MOVE A TO R9 (9).                                                DMN0924
      GO TO RAL52.                                                     DMN0925
RAL522. ADD 1 TO CNPT.                                                 DMN0926
      MOVE CN (CNPT) TO A.                                             DMN0927
      IF A = ' ' GO TO RAL522.                                         DMN0928
      IF A = '$' GO TO RAL56.                                          DMN0929
      IF A = '+' GO TO RAL52.                                          DMN0930
      IF A = '-' GO TO RAL52.                                          DMN0931
      IF A = '*' GO TO RAL52.                                          DMN0932
      IF A = '/' GO TO RAL52.                                          DMN0933
      IF A = '(' GO TO RAL52.                                          DMN0934
      IF A = ')' GO TO RAL52.                                          DMN0935
      IF A = '.' GO TO RAL52.                                          DMN0936
      IF A = ',' GO TO RAL52.                                          DMN0937
      GO TO RAL522.                                                    DMN0938
RAL54. IF REG9 = '          ' AND A = '$' GO TO RAL56.                 DMN0939
      IF REG9 = '          ' GO TO RAL521.                             DMN0940
      PERFORM R9LEFT-JUSTIFY.                                          DMN0941
      MOVE R9 (1) TO B.                                                DMN0942
      PERFORM ATEST.                                                   DMN0943
      IF NOT ALPHA GO TO RAL521.                                       DMN0944
      MOVE 1 TO PNU.                                                   DMN0945
RAL53. MOVE SYMBOL-TABLE-CODE TO N.                                    DMN0946
      PERFORM UNPACK.                                                  DMN0947
      IF PNU1 = 1 GO TO RAL56.                                         DMN0948
      MOVE TEMPORARY TO TABLE-AREA.                                    DMN0949
      IF TB1 = REG9 GO TO RAL7.                                        DMN0950
      GO TO RAL53.                                                     DMN0951
RAL56. IF A NOT = '$' GO TO RAL521.                                    DMN0952
      MOVE 1 TO X-FOUND.                                               DMN0953
      MOVE 8 TO CNPT.                                                  DMN0954
      MOVE 0 TO PTM.                                                   DMN0955
RAL57. ADD 1 TO CNPT.                                                  DMN0956
      MOVE CN (CNPT) TO A.                                             DMN0957
      IF A = '=' GO TO RAL58.                                          DMN0958
      ADD 1 TO PTM.                                                    DMN0959
      MOVE A TO TM (PTM).                                              DMN0960
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        GO TO RAL57.                                          DMN0961
RAL58.  ADD 1 TO PTM.                                         DMN0962
        MOVE '$' TO TM (PTM).                                 DMN0963
        MOVE XACT-CODE TO N.                                  DMN0964
        PERFORM PUT-AWAY.                                     DMN0965
        GO TO RAL2.                                           DMN0966
RAL7.   MOVE 1 TO L-FOUND.                                    DMN0967
        MOVE '$' TO TM (1).                                   DMN0968
        MOVE XACT-CODE TO N.                                  DMN0969
        PERFORM PUT-AWAY.                                     DMN0970
        GO TO RAL2.                                           DMN0971
RAL1.   MOVE ZERO TO ZORRO, NOTE NO-OP.                       DMN0972
        IF DUMP-D NOT = 1 GO TO DUMP-L.                       DMN0973
        MOVE 0 TO N.                                          DMN0974
DUMP-A. ADD 1 TO N.                                           DMN0975
        IF N GREATER THAN 30 GO TO DUMP-L.                    DMN0976
        MOVE 1 TO PNU.                                        DMN0977
DUMP-B. MOVE SPACES TO TEMPORARY.                             DMN0978
        PERFORM UNPACK.                                       DMN0979
        IF PNU1 = 1 GO TO DUMP-A.                             DMN0980
        MOVE TEMPORARY TO OUTCARD.                            DMN0981
        MOVE N TO REG2.                                       DMN0982
        MOVE R2 (1) TO DC (79).                               DMN0983
        MOVE R2 (2) TO DC (80).                               DMN0984
        WRITE OUT.                                            DMN0985
        GO TO DUMP-B.                                         DMN0986
DUMP-L. MOVE ZERO TO ZORRO, NOTE NO-OP.                       DMN0987
DUMP-Z. MOVE ZERO TO ZORRO, NOTE NO-OP.                       DMN0988
        OPEN OUTPUT BINFILE.                                  DMN0989
        MOVE 0 TO DATPT.                                      DMN0990
        MOVE 1 TO ENDD.                                       DMN0991
MMM.    MOVE 0 TO BINPT.                                      DMN0992
MMMA.   ADD 1 TO BINPT.                                       DMN0993
        ADD 1 TO DATPT.                                       DMN0994
        MOVE DAT (DATPT) TO BINN (BINPT).                     DMN0995
        IF DAT (DATPT) NOT = 1 GO TO MMMB.                    DMN0996
        MOVE 0 TO ENDD.                                       DMN0997
        IF DAT (DATPT) = 0 GO TO MMMC.                        DMN0998
        MOVE 1 TO ENDD.                                       DMN0999
MMMB.   IF BINPT LESS THAN 500 GO TO MMMA.                    DMN1000
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    WRITE BINOUT.                                                        DMN1001
    GO TO MMM.                                                           DMN1002
MMMC. WRITE BINOUT.                                                      DMN1003
    CLOSE BINFILE.                                                       DMN1004
    CLOSE INFILE, OUTFILE.                                               DMN1005
NWB01. ENTER ASSEMBLY-PROGRAM.                                           DMN1006
CALL    DMNNWB                                                           DMN1007
NWB02. ENTER COBOL.                                                      DMN1008
    STOP RUN.                                                            DMN1009
R4LEFT SECTION.                                                          DMN1010
R4L. MOVE R4 (2) TO R4 (1).                                              DMN1011
    MOVE R4 (3) TO R4 (2).                                               DMN1012
    MOVE R4 (4) TO R4 (3).                                               DMN1013
    MOVE SPACE TO R4 (4).                                                DMN1014
    NOTE FINISH R4LEFT.                                                  DMN1015
CONT-READ SECTION.                                                       DMN1016
C41. MOVE ZERO TO CNPT.                                                  DMN1017
    MOVE ZERO TO CDPT.                                                   DMN1018
    MOVE 0 TO PHASEND.                                                   DMN1019
C1. ADD 1 TO CNPT.                                                       DMN1020
    ADD 1 TO CDPT.                                                       DMN1021
    MOVE CD (CDPT) TO CN (CNPT).                                         DMN1022
    IF CDPT IS NOT EQUAL TO 6 GO TO C1.                                  DMN1023
C2. MOVE 6 TO CDPT.                                                      DMN1024
C3. ADD 1 TO CNPT.                                                       DMN1025
    IF CNPT NOT LESS THAN 960 GO TO TOO-MANY-CONTINUATION.               DMN1026
    ADD 1 TO CDPT.                                                       DMN1027
    MOVE CD (CDPT) TO CN (CNPT).                                         DMN1028
    IF CD (CDPT) IS NOT EQUAL TO '$' GO TO C3.                           DMN1029
    SUBTRACT 1 FROM CNPT.                                                DMN1030
C31. PERFORM READ-IN.                                                    DMN1031
    MOVE 73 TO CDPT.                                                     DMN1032
C123. SUBTRACT 1 FROM CDPT.                                              DMN1033
    IF CD (CDPT) = ' ' GO TO C123.                                       DMN1034
    ADD 1 TO CDPT.                                                       DMN1035
    MOVE '$' TO CD (CDPT).                                               DMN1036
    IF CD (1) = 'C' GO TO C5.                                            DMN1037
    MOVE SPACES TO REG9.                                                 DMN1038
    MOVE 6 TO CDPT.                                                      DMN1039
EN. ADD 1 TO CDPT.                                                       DMN1040
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    MOVE CD (CDPT) TO A.                                          DMN1041
    IF A = ' ' GO TO EN.                                          DMN1042
    IF A = '$' GO TO EN2.                                         DMN1043
    IF R9 (1) NOT = ' ' GO TO EN1.                                DMN1044
    PERFORM R9LEFT.                                               DMN1045
    MOVE A TO R9 (9).                                             DMN1046
    GO TO EN.                                                     DMN1047
EN2. IF REG9 = '          ' GO TO EN3.                            DMN1048
    PERFORM R9LEFT-JUSTIFY.                                       DMN1049
EN1. IF REG9 = TEST MOVE 1 TO PHASEND.                            DMN1050
EN3. IF CD (6) = '0' GO TO C5.                                    DMN1051
    IF CD (1) = '$' GO TO C5.                                     DMN1052
    IF CD (6) IS NOT EQUAL TO ' ' GO TO C2.                       DMN1053
C5. EXIT.                                                         DMN1054
    NOTE FINISH CONT-READ.                                        DMN1055
SCAN-CARD SECTION.                                                DMN1056
SC. MOVE SPACES TO REG3.                                          DMN1057
    MOVE ZERO TO EQBC.                                            DMN1058
    MOVE ZERO TO BC.                                              DMN1059
    MOVE ZERO TO EQ.                                              DMN1060
    MOVE ZERO TO EQCM.                                            DMN1061
    MOVE 6 TO CNPT.                                               DMN1062
C6. ADD 1 TO CNPT.                                                DMN1063
    MOVE CN (CNPT) TO A.                                          DMN1064
    IF A IS EQUAL TO ' ' GO TO C6.                                DMN1065
    IF A IS EQUAL TO '$' GO TO C7.                                DMN1066
    IF R3 (1) IS NOT EQUAL TO ' ' GO TO C8.                       DMN1067
    MOVE R3 (2) TO R3 (1).                                        DMN1068
    MOVE R3 (3) TO R3 (2).                                        DMN1069
    MOVE A TO R3 (3).                                             DMN1070
C8. IF A IS EQUAL TO '(' ADD 1 TO BC.                             DMN1071
    IF A IS NOT EQUAL TO ')' GO TO C9.                            DMN1072
    IF BC = 0 PERFORM BRACKET-ERROR-1.                            DMN1073
    SUBTRACT 1 FROM BC.                                           DMN1074
C9. IF A = '=' AND BC = 0 MOVE 1 TO EQ.                           DMN1075
    IF A = '=' AND BC NOT = 0 MOVE 1 TO EQBC.                     DMN1076
    IF A = ',' AND EQ = 1 AND BC = 0 MOVE 1 TO EQCM.              DMN1077
    GO TO C6.                                                     DMN1078
C7. IF BC NOT = 0 PERFORM BRACKET-ERROR-2.                        DMN1079
    IF R3 (3) = ' ' GO TO C11.                                    DMN1080
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C10. IF R3 (1) NOT = ' ' GO TO C11.                          DMN1081
     MOVE R3 (2) TO R3 (1).                                  DMN1082
     MOVE R3 (3) TO R3 (2).                                  DMN1083
     MOVE SPACE TO R3 (3).                                   DMN1084
     GO TO C10.                                              DMN1085
C11. EXIT.                                                   DMN1086
     NOTE FINISH  SCAN-CARD.                                 DMN1087
FLL SECTION.                                                 DMN1088
FLL5. MOVE SPACES TO FWRITE.                                 DMN1089
FLL6. ADD 1 TO CNPT.                                         DMN1090
     MOVE CN (CNPT) TO A.                                    DMN1091
     IF A = '$' GO TO PHA2.                                  DMN1092
     IF A NOT = '(' GO TO FLL6.                              DMN1093
     MOVE 6 TO CNPT4.                                        DMN1094
FLL7. ADD 1 TO CNPT.                                         DMN1095
     MOVE CN (CNPT) TO A.                                    DMN1096
     IF A = ')' AND BC = 0 GO TO FLL8.                       DMN1097
     IF A = ')' SUBTRACT 1 FROM BC.                          DMN1098
     IF A = '(' ADD 1 TO BC.                                 DMN1099
     ADD 1 TO CNPT4.                                         DMN1100
     MOVE A TO FWR (CNPT4).                                  DMN1101
     GO TO FLL7.                                             DMN1102
FLL8. EXIT.                                                  DMN1103
     NOTE FINISH FLL.                                        DMN1104
AVA-INT SECTION.                                             DMN1105
AVI. ADD 1 TO AVAILABLE-SNM.                                 DMN1106
     MOVE AVAILABLE-SNM TO AL5.                              DMN1107
     ADD 1 TO PTM.                                           DMN1108
     MOVE A5 (1) TO TM (PTM).                                DMN1109
     ADD 1 TO PTM.                                           DMN1110
     MOVE A5 (2) TO TM (PTM).                                DMN1111
     ADD 1 TO PTM.                                           DMN1112
     MOVE A5 (3) TO TM (PTM).                                DMN1113
     ADD 1 TO PTM.                                           DMN1114
     MOVE A5 (4) TO TM (PTM).                                DMN1115
     ADD 1 TO PTM.                                           DMN1116
     MOVE A5 (5) TO TM (PTM).                                DMN1117
     NOTE FINISH AVA-INT.                                    DMN1118
R9LEFT-JUSTIFY SECTION.                                      DMN1119
R9LJJJ. IF REG9 = '          ' GO TO UNUSUAL-END.            DMN1120
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R9LJ1. IF R9 (1) NOT = ' ' GO TO R9LJ2.                    DMN1121
    PERFORM R9LEFT.                                        DMN1122
    GO TO R9LJ1.                                           DMN1123
R9LJ2. EXIT.                                               DMN1124
    NOTE FINISH R9LEFT-JUSTIFY.                            DMN1125
R9LEFT SECTION.                                            DMN1126
R9L. MOVE R9 (2) TO R9 (1).                                DMN1127
    MOVE R9 (3) TO R9 (2).                                 DMN1128
    MOVE R9 (4) TO R9 (3).                                 DMN1129
    MOVE R9 (5) TO R9 (4).                                 DMN1130
    MOVE R9 (6) TO R9 (5).                                 DMN1131
    MOVE R9 (7) TO R9 (6).                                 DMN1132
    MOVE R9 (8) TO R9 (7).                                 DMN1133
    MOVE R9 (9) TO R9 (8).                                 DMN1134
    MOVE SPACE TO R9 (9).                                  DMN1135
    NOTE FINISH R9LEFT.                                    DMN1136
FIXED-POINT-TEST SECTION.                                  DMN1137
FPT. MOVE 0 TO FXD.                                        DMN1138
    IF A IS EQUAL TO 'I' MOVE 1 TO FXD.                    DMN1139
    IF A IS EQUAL TO 'J' MOVE 1 TO FXD.                    DMN1140
    IF A IS EQUAL TO 'K' MOVE 1 TO FXD.                    DMN1141
    IF A IS EQUAL TO 'L' MOVE 1 TO FXD.                    DMN1142
    IF A IS EQUAL TO 'M' MOVE 1 TO FXD.                    DMN1143
    IF A IS EQUAL TO 'N' MOVE 1 TO FXD.                    DMN1144
    NOTE FINISH FIXED-POINT-TEST.                          DMN1145
TBL1LEFT SECTION.                                          DMN1146
TLL. MOVE TBL1 (2) TO TBL1 (1).                            DMN1147
    MOVE TBL1 (3) TO TBL1 (2).                             DMN1148
    MOVE TBL1 (4) TO TBL1 (3).                             DMN1149
    MOVE TBL1 (5) TO TBL1 (4).                             DMN1150
    MOVE TBL1 (6) TO TBL1 (5).                             DMN1151
    MOVE TBL1 (7) TO TBL1 (6).                             DMN1152
    MOVE TBL1 (8) TO TBL1 (7).                             DMN1153
    MOVE TBL1 (9) TO TBL1 (8).                             DMN1154
    MOVE SPACE TO TBL1 (9).                                DMN1155
    NOTE FINISH TBL1LEFT.                                  DMN1156
WRITE-OUT SECTION.                                         DMN1157
WOR1. IF DELAY-D = 0 GO TO WOR2.                           DMN1158
    IF DELAY-D1 = 1 GO TO WOR3.                            DMN1159
    MOVE OUTCARD TO OUTCARD1.                              DMN1160
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    MOVE 1 TO DELAY-D1.                                          DMN1161
    GO TO WOR4.                                                  DMN1162
WOR3. MOVE OUTCARD1 TO OUTCARD2.                                 DMN1163
    MOVE OUTCARD TO OUTCARD1.                                    DMN1164
    MOVE OUTCARD2 TO OUTCARD.                                    DMN1165
WOR2. PERFORM WRITE-OUT-1.                                       DMN1166
WOR4. EXIT.                                                      DMN1167
    NOTE FINISH WRITE-OUT.                                       DMN1168
WRITE-OUT-1 SECTION.                                             DMN1169
WRO11. IF DATAD = 1 GO TO WO.                                    DMN1170
    IF DC (1) = '$' GO TO WO.                                    DMN1171
WRO. ADD 1 TO SENM.                                              DMN1172
    MOVE SENM TO SENMA.                                          DMN1173
    MOVE SENMA1 (1) TO DC (76).                                  DMN1174
    MOVE SENMA1 (2) TO DC (77).                                  DMN1175
    MOVE SENMA1 (3) TO DC (78).                                  DMN1176
    MOVE SENMA1 (4) TO DC (79).                                  DMN1177
    MOVE SENMA1 (5) TO DC (80).                                  DMN1178
WO. WRITE OUT.                                                   DMN1179
    NOTE FINISH WRITE-OUT-1.                                     DMN1180
TOO-MANY-CONTINUATION SECTION.                                   DMN1181
TMC. MOVE SPACES TO OUT.                                         DMN1182
    MOVE 'C TOO MANY CONTINUATION CARDS.                 ' TO    DMN1183
          OUTCARD.                                               DMN1184
    PERFORM WRITE-OUT.                                           DMN1185
    NOTE FINISH TOO-MANY-CONTINUATION.                           DMN1186
BRACKET-ERROR-1 SECTION.                                         DMN1187
BE1. MOVE SPACES TO OUT.                                         DMN1188
    MOVE 'C POSSIBLE EXCESS RIGHT BRACKET.               ' TO    DMN1189
          OUTCARD.                                               DMN1190
    PERFORM WRITE-OUT.                                           DMN1191
    NOTE FINISH BRACKET-ERROR-1.                                 DMN1192
BRACKET-ERROR-2 SECTION.                                         DMN1193
BE2. MOVE SPACES TO OUT.                                         DMN1194
    MOVE 'C POSSIBLE EXCESS BRACKET.                     ' TO    DMN1195
          OUTCARD.                                               DMN1196
    PERFORM WRITE-OUT.                                           DMN1197
    NOTE FINISH BRACKET-ERROR-2.                                 DMN1198
DIM-ERAS SECTION.                                                DMN1199
DIM-ERA2. MOVE SPACES TO OUT.                                    DMN1200
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     MOVE 'DIMENSION TOO BIG FOR    ' TO OUTCARD.                    DMN1201
     GO TO V1.                                                       DMN1202
DIM-ERA. MOVE SPACES TO OUT.                                         DMN1203
     MOVE 'NO DIMENSION CARD FOR    ' TO OUTCARD.                    DMN1204
V1. MOVE R9 (1) TO DC (23).                                          DMN1205
     MOVE R9 (2) TO DC (24).                                         DMN1206
     MOVE R9 (3) TO DC (25).                                         DMN1207
     MOVE R9 (4) TO DC (26).                                         DMN1208
     MOVE R9 (5) TO DC (27).                                         DMN1209
     MOVE R9 (6) TO DC (28).                                         DMN1210
     MOVE R9 (7) TO DC (29).                                         DMN1211
     MOVE R9 (8) TO DC (30).                                         DMN1212
     MOVE R9 (9) TO DC (31).                                         DMN1213
     PERFORM WRITE-OUT.                                              DMN1214
     GO TO UNUSUAL-END.                                              DMN1215
UNUSUAL-END SECTION.                                                 DMN1216
UE. DISPLAY 'UNUSUAL END. ' .                                        DMN1217
     STOP RUN.                                                       DMN1218
     NOTE FINISH UNUSUAL-END.                                        DMN1219
AL5-NM5 SECTION.                                                     DMN1220
AM. MOVE A5 (1) TO AL, PERFORM AL-NM, MOVE NM TO P1.                 DMN1221
     MOVE A5 (2) TO AL, PERFORM AL-NM, MOVE NM TO P2.                DMN1222
     MOVE A5 (3) TO AL, PERFORM AL-NM, MOVE NM TO P3.                DMN1223
     MOVE A5 (4) TO AL, PERFORM AL-NM, MOVE NM TO P4.                DMN1224
     MOVE A5 (5) TO AL, PERFORM AL-NM, MOVE NM TO P5.                DMN1225
     COMPUTE NM5 = 10000 * P1 + 1000 * P2 + 100 * P3 + 10 * P4       DMN1226
                 + P5.                                               DMN1227
     NOTE FINISH AL5-NM5.                                            DMN1228
AL-NM SECTION.                                                       DMN1229
AN1. IF AL NOT = '0' GO TO AN2.                                      DMN1230
     MOVE 0 TO NM.                                                   DMN1231
     GO TO AN99.                                                     DMN1232
AN2. IF AL NOT = '1' GO TO AN3.                                      DMN1233
     MOVE 1 TO NM.                                                   DMN1234
     GO TO AN99.                                                     DMN1235
AN3. IF AL NOT = '2' GO TO AN4.                                      DMN1236
     MOVE 2 TO NM.                                                   DMN1237
     GO TO AN99.                                                     DMN1238
AN4. IF AL NOT = '3' GO TO AN5.                                      DMN1239
     MOVE 3 TO NM.                                                   DMN1240
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    GO TO AN99.                                                          DMN1241
AN5. IF AL NOT = '4' GO TO AN6.                                          DMN1242
    MOVE 4 TO NM.                                                        DMN1243
    GO TO AN99.                                                          DMN1244
AN6. IF AL NOT = '5' GO TO AN7.                                          DMN1245
    MOVE 5 TO NM.                                                        DMN1246
    GO TO AN99.                                                          DMN1247
AN7. IF AL NOT = '6' GO TO AN8.                                          DMN1248
    MOVE 6 TO NM.                                                        DMN1249
    GO TO AN99.                                                          DMN1250
AN8. IF AL NOT = '7' GO TO AN9.                                          DMN1251
    MOVE 7 TO NM.                                                        DMN1252
    GO TO AN99.                                                          DMN1253
AN9. IF AL NOT = '8' GO TO AN10.                                         DMN1254
    MOVE 8 TO NM.                                                        DMN1255
    GO TO AN99.                                                          DMN1256
AN10. IF AL NOT = '9' GO TO AN11.                                        DMN1257
    MOVE 9 TO NM.                                                        DMN1258
    GO TO AN99.                                                          DMN1259
AN11. DISPLAY ' ALPHA TO NUMBER MOVE ATTEMPTED  ', AL.                   DMN1260
    GO TO UNUSUAL-END.                                                   DMN1261
AN99. EXIT.                                                              DMN1262
    NOTE FINISH AL-NM.                                                   DMN1263
NTEST SECTION.                                                           DMN1264
NS. MOVE 0 TO NT.                                                        DMN1265
    IF B = '0' GO TO NS1.                                                DMN1266
    IF B = '1' GO TO NS1.                                                DMN1267
    IF B = '2' GO TO NS1.                                                DMN1268
    IF B = '3' GO TO NS1.                                                DMN1269
    IF B = '4' GO TO NS1.                                                DMN1270
    IF B = '5' GO TO NS1.                                                DMN1271
    IF B = '6' GO TO NS1.                                                DMN1272
    IF B = '7' GO TO NS1.                                                DMN1273
    IF B = '8' GO TO NS1.                                                DMN1274
    IF B = '9' GO TO NS1.                                                DMN1275
    GO TO NS2.                                                           DMN1276
NS1. MOVE 1 TO NT.                                                       DMN1277
NS2. EXIT.                                                               DMN1278
    NOTE FINISH NTEST.                                                   DMN1279
ATEST SECTION.                                                           DMN1280
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AT1. MOVE 0 TO NT.                                                  DMN1281
     IF B = 'A' GO TO AT2.                                          DMN1282
     IF B = 'B' GO TO AT2.                                          DMN1283
     IF B = 'C' GO TO AT2.                                          DMN1284
     IF B = 'D' GO TO AT2.                                          DMN1285
     IF B = 'E' GO TO AT2.                                          DMN1286
     IF B = 'F' GO TO AT2.                                          DMN1287
     IF B = 'G' GO TO AT2.                                          DMN1288
     IF B = 'H' GO TO AT2.                                          DMN1289
     IF B = 'I' GO TO AT2.                                          DMN1290
     IF B = 'J' GO TO AT2.                                          DMN1291
     IF B = 'K' GO TO AT2.                                          DMN1292
     IF B = 'L' GO TO AT2.                                          DMN1293
     IF B = 'M' GO TO AT2.                                          DMN1294
     IF B = 'N' GO TO AT2.                                          DMN1295
     IF B = 'O' GO TO AT2.                                          DMN1296
     IF B = 'P' GO TO AT2.                                          DMN1297
     IF B = 'Q' GO TO AT2.                                          DMN1298
     IF B = 'R' GO TO AT2.                                          DMN1299
     IF B = 'S' GO TO AT2.                                          DMN1300
     IF B = 'T' GO TO AT2.                                          DMN1301
     IF B = 'U' GO TO AT2.                                          DMN1302
     IF B = 'V' GO TO AT2.                                          DMN1303
     IF B = 'W' GO TO AT2.                                          DMN1304
     IF B = 'X' GO TO AT2.                                          DMN1305
     IF B = 'Y' GO TO AT2.                                          DMN1306
     IF B = 'Z' GO TO AT2.                                          DMN1307
     GO TO AT3.                                                     DMN1308
AT2. MOVE 2 TO NT.                                                  DMN1309
AT3. EXIT.                                                          DMN1310
     NOTE FINISH ATEST.                                             DMN1311
RECONSTRUCT-START SECTION.                                          DMN1312
RS1. MOVE R2 (1) TO AL, PERFORM AL-NM, MOVE NM TO P1.               DMN1313
     MOVE R2 (2) TO AL, PERFORM AL-NM, MOVE NM TO P2.               DMN1314
     COMPUTE RNM = 10 * P1 + P2.                                    DMN1315
     MOVE 00 TO RNM2.                                               DMN1316
     NOTE FINISH RECONSTRUCT-START.                                 DMN1317
RECONSTRUCT-DIFF SECTION.                                           DMN1318
RD1. MOVE 0 TO RDS.                                                 DMN1319
     IF RNM2 = 0 GO TO RD3.                                         DMN1320
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    IF RNM2 = 1 GO TO RD35.                                    DMN1321
    IF RNM2 LESS THAN 10 GO TO RD4.                            DMN1322
RD5. MOVE 'D' TO TBL1 (1).                                     DMN1323
    MOVE RNM2 TO REG2.                                         DMN1324
    MOVE R2 (1) TO TBL1 (2).                                   DMN1325
    MOVE R2 (2) TO TBL1 (3).                                   DMN1326
    MOVE R9 (1) TO TBL1 (4).                                   DMN1327
    MOVE R9 (2) TO TBL1 (5).                                   DMN1328
    MOVE R9 (3) TO TBL1 (6).                                   DMN1329
    MOVE R9 (4) TO TBL1 (7).                                   DMN1330
    MOVE R9 (5) TO TBL1 (8).                                   DMN1331
    MOVE R9 (6) TO TBL1 (9).                                   DMN1332
    GO TO RD6.                                                 DMN1333
RD4. MOVE 'D' TO TBL1 (1).                                     DMN1334
    MOVE RNM2 TO REG2.                                         DMN1335
    MOVE R2 (2) TO TBL1 (2).                                   DMN1336
    MOVE R9 (1) TO TBL1 (3).                                   DMN1337
    MOVE R9 (2) TO TBL1 (4).                                   DMN1338
    MOVE R9 (3) TO TBL1 (5).                                   DMN1339
    MOVE R9 (4) TO TBL1 (6).                                   DMN1340
    MOVE R9 (5) TO TBL1 (7).                                   DMN1341
    MOVE R9 (6) TO TBL1 (8).                                   DMN1342
    MOVE R9 (7) TO TBL1 (9).                                   DMN1343
    GO TO RD6.                                                 DMN1344
RD35. MOVE 'D' TO TBL1 (1).                                    DMN1345
    MOVE R9 (1) TO TBL1 (2).                                   DMN1346
    MOVE R9 (2) TO TBL1 (3).                                   DMN1347
    MOVE R9 (3) TO TBL1 (4).                                   DMN1348
    MOVE R9 (4) TO TBL1 (5).                                   DMN1349
    MOVE R9 (5) TO TBL1 (6).                                   DMN1350
    MOVE R9 (6) TO TBL1 (7).                                   DMN1351
    MOVE R9 (7) TO TBL1 (8).                                   DMN1352
    MOVE R9 (8) TO TBL1 (9).                                   DMN1353
    GO TO RD6.                                                 DMN1354
RD3. MOVE REG9 TO TB1.                                         DMN1355
RD6. ADD 1 TO RNM2.                                            DMN1356
    IF RNM2 = RNM MOVE 1 TO RDS.                               DMN1357
    NOTE FINISH RECONSTRUCT-DIFF.                              DMN1358
READ-IN SECTION.                                               DMN1359
RI. READ INFILE, AT END GO TO RIXX.                            DMN1360
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RIXX. EXIT.                                                          DMN1361
    NOTE FINISH READ-IN.                                             DMN1362
PUT-AWAY SECTION.                                                    DMN1363
PA. IF STA (N) NOT = 0 GO TO B1.                                     DMN1364
    ADD 1 TO PTE.                                                    DMN1365
    MOVE PTE TO STA (N).                                             DMN1366
    GO TO PA1.                                                       DMN1367
PA3. MOVE 'C STORE OVERFLOW' TO OUTCARD.                             DMN1368
    PERFORM WRITE-OUT.                                               DMN1369
    GO TO UNUSUAL-END.                                               DMN1370
B1. ADD 1 TO PTE.                                                    DMN1371
    MOVE PTE TO PET.                                                 DMN1372
    MOVE PT (N) TO D5.                                               DMN1373
    MOVE PTS (1) TO ST (D5).                                         DMN1374
    ADD 1 TO D5.                                                     DMN1375
    MOVE PTS (2) TO ST (D5).                                         DMN1376
    ADD 1 TO D5.                                                     DMN1377
    MOVE PTS (3) TO ST (D5).                                         DMN1378
    ADD 1 TO D5.                                                     DMN1379
    MOVE PTS (4) TO ST (D5).                                         DMN1380
    ADD 1 TO D5.                                                     DMN1381
    MOVE PTS (5) TO ST (D5).                                         DMN1382
PA1. MOVE PTE TO PT (N).                                             DMN1383
    MOVE 'E' TO ST (PTE).                                            DMN1384
    ADD 4 TO PTE.                                                    DMN1385
P.  MOVE 0 TO PTM.                                                   DMN1386
Q1. ADD 1 TO PTE.                                                    DMN1387
    IF PTE GREATER THAN STORE-SIZE GO TO PA3.                        DMN1388
    ADD 1 TO PTM.                                                    DMN1389
    MOVE TM (PTM) TO ST (PTE).                                       DMN1390
    IF TM (PTM) NOT = '$' GO TO Q1.                                  DMN1391
    NOTE FINISH PUT-AWAY.                                            DMN1392
UNPACK SECTION.                                                      DMN1393
UP. IF PNU NOT = 1 GO TO N3.                                         DMN1394
    MOVE 0 TO PNU.                                                   DMN1395
    IF STA (N) = 0 GO TO FIN.                                        DMN1396
    MOVE STA (N) TO STP (N).                                         DMN1397
    GO TO N6.                                                        DMN1398
N3. MOVE STP (N) TO PRE.                                             DMN1399
    IF ST (PRE) = 'E' GO TO FIN.                                     DMN1400
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     MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P1.          DMN1401
     ADD 1 TO PRE.                                               DMN1402
     MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P2.          DMN1403
     ADD 1 TO PRE.                                               DMN1404
     MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P3.          DMN1405
     ADD 1 TO PRE.                                               DMN1406
     MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P4.          DMN1407
     ADD 1 TO PRE.                                               DMN1408
     MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P5.          DMN1409
     COMPUTE STP (N) = 10000 * P1 + 1000 * P2 + 100 * P3         DMN1410
                       + 10 * P4 + P5.                           DMN1411
N6.  MOVE STP (N) TO PRE.                                        DMN1412
     ADD 4 TO PRE.                                               DMN1413
     MOVE 0 TO PTR.                                              DMN1414
N4.  ADD 1 TO PTR.                                               DMN1415
     ADD 1 TO PRE.                                               DMN1416
     MOVE ST (PRE) TO TR (PTR).                                  DMN1417
     IF ST (PRE) NOT = '$' GO TO N4.                             DMN1418
     MOVE 0 TO PNU1.                                             DMN1419
     GO TO N5.                                                   DMN1420
FIN. MOVE 1 TO PNU1.                                             DMN1421
N5.  EXIT.                                                       DMN1422
     NOTE FINISH UNPACK.                                         DMN1423
INSERT SECTION.                                                  DMN1424
INS. SUBTRACT 1 FROM PRE.                                        DMN1425
     IF PRE = 0 GO TO INS1.                                      DMN1426
     IF ST (PRE) NOT = '$' GO TO INS.                            DMN1427
INS1. ADD 1 TO PRE.                                              DMN1428
     IF ST (PRE) NOT = 'E' GO TO INS2.                           DMN1429
     PERFORM PUT-AWAY.                                           DMN1430
     GO TO INSX.                                                 DMN1431
INS2. ADD 1 TO PTE.                                              DMN1432
     MOVE PTE TO PET.                                            DMN1433
     MOVE 1 TO D5.                                               DMN1434
INS3. MOVE ST (PRE) TO ST (PTE).                                 DMN1435
     MOVE PTS (D5) TO ST (PRE).                                  DMN1436
     IF D5 = 5 GO TO INS4.                                       DMN1437
     ADD 1 TO PTE.                                               DMN1438
     ADD 1 TO PRE.                                               DMN1439
     ADD 1 TO D5.                                                DMN1440
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      GO TO INS3.                                          DMN1441
INS4. MOVE 0 TO PTM.                                       DMN1442
INS5. ADD 1 TO PTM.                                        DMN1443
      ADD 1 TO PTE.                                        DMN1444
      MOVE TM (PTM) TO ST (PTE).                           DMN1445
      IF TM (PTM) NOT = '$' GO TO INS5.                    DMN1446
INSX. EXIT.                                                DMN1447
      NOTE FINISH INSERT.                                  DMN1448
REPLACE SECTION.                                           DMN1449
RP. ADD 1 TO PTR.                                          DMN1450
      ADD 1 TO PRE.                                        DMN1451
RP1. SUBTRACT 1 FROM PTR.                                  DMN1452
      SUBTRACT 1 FROM PRE.                                 DMN1453
      MOVE TR (PTR) TO ST (PRE).                           DMN1454
      IF PTR NOT = 1 GO TO RP1.                            DMN1455
      NOTE FINISH REPLACE.                                 DMN1456
PICK-UP-COND SECTION.                                      DMN1457
CND3. MOVE 8 TO IFPT.                                      DMN1458
      MOVE '0' TO IFA (8).                                 DMN1459
      MOVE 0 TO BC.                                        DMN1460
      ADD 1 TO COND-NM.                                    DMN1461
CND4. ADD 1 TO CNPT.                                       DMN1462
      MOVE CN (CNPT) TO A.                                 DMN1463
      IF A NOT = '(' GO TO CND5.                           DMN1464
      ADD 1 TO BC.                                         DMN1465
      GO TO CND8.                                          DMN1466
CND5. IF A NOT = ')' GO TO CND7.                           DMN1467
      IF BC = 0 GO TO CND10.                               DMN1468
      SUBTRACT 1 FROM BC.                                  DMN1469
CND8. ADD 1 TO IFPT.                                       DMN1470
      MOVE A TO IFA (IFPT).                                DMN1471
      GO TO CND4.                                          DMN1472
CND7. IF A NOT = ',' GO TO CND8.                           DMN1473
      IF BC NOT = 0 GO TO CND8.                            DMN1474
      MOVE '1' TO IFA (8).                                 DMN1475
      MOVE 1 TO CCC.                                       DMN1476
      GO TO CND8.                                          DMN1477
CND10. ADD 1 TO IFPT.                                      DMN1478
      MOVE '$' TO IFA (IFPT).                              DMN1479
      NOTE FINISH PICK-UP-COND.                            DMN1480
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CONDITION SECTION.                                          DMN1481
COND. MOVE 6 TO CNPT.                                       DMN1482
    MOVE 'C' TO IFA (1).                                    DMN1483
    MOVE 'E' TO IFA (2).                                    DMN1484
CND1. ADD 1 TO CNPT.                                        DMN1485
    MOVE CN (CNPT) TO A.                                    DMN1486
    IF A = ' ' GO TO CND1.                                  DMN1487
    IF A = '(' GO TO CNDA.                                  DMN1488
    IF A = 'N' MOVE 'N' TO IFA (2).                         DMN1489
CND2. ADD 1 TO CNPT.                                        DMN1490
    IF CN (CNPT) NOT = '(' GO TO CND2.                      DMN1491
CNDA. PERFORM PICK-UP-COND.                                 DMN1492
    MOVE '00000' TO AL5.                                    DMN1493
CND21. ADD 1 TO CNPT.                                       DMN1494
    MOVE CN (CNPT) TO B.                                    DMN1495
    IF B = '$' GO TO CND22.                                 DMN1496
    IF B = '(' GO TO CND22.                                 DMN1497
    PERFORM NTEST.                                          DMN1498
    IF NOT NUMBER GO TO CND21.                              DMN1499
    MOVE B TO A5 (5).                                       DMN1500
CND23. ADD 1 TO CNPT.                                       DMN1501
    MOVE CN (CNPT) TO B.                                    DMN1502
    PERFORM NTEST.                                          DMN1503
    IF NOT NUMBER GO TO CND24.                              DMN1504
    MOVE AL5 TO Z5.                                         DMN1505
    MOVE Z4 TO AL5.                                         DMN1506
    MOVE B TO A5 (5).                                       DMN1507
    GO TO CND23.                                            DMN1508
CND24. IF B = '$' GO TO CND22.                              DMN1509
    IF B = '(' GO TO CND22.                                 DMN1510
    ADD 1 TO CNPT.                                          DMN1511
    MOVE CN (CNPT) TO B.                                    DMN1512
    GO TO CND24.                                            DMN1513
CND22. MOVE A5 (1) TO IFA (3).                              DMN1514
    MOVE A5 (2) TO IFA (4).                                 DMN1515
    MOVE A5 (3) TO IFA (5).                                 DMN1516
    MOVE A5 (4) TO IFA (6).                                 DMN1517
    MOVE A5 (5) TO IFA (7).                                 DMN1518
    MOVE IFIF TO INTERMEDIATE.                              DMN1519
    MOVE CONDITION-CODE TO N.                               DMN1520
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      PERFORM PUT-AWAY.                                          DMN1521
      IF B = '(' GO TO CNDA.                                     DMN1522
      GO TO PHA2.                                                DMN1523
      NOTE FINISH CONDITION.                                     DMN1524
 BOUNDARY-EQUATION SECTION.                                      DMN1525
 BOUNDEQ. MOVE 6 TO CNPT.                                        DMN1526
      ADD 1 TO BC-NM.                                            DMN1527
      SUBTRACT 1 FROM BCC.                                       DMN1528
      MOVE 0 TO BC.                                              DMN1529
 BE1. ADD 1 TO CNPT.                                             DMN1530
      MOVE CN (CNPT) TO A.                                       DMN1531
      IF A = '$' GO TO BE99.                                     DMN1532
      IF A = ',' AND BC = 0 GO TO BE70.                          DMN1533
      IF A NOT = '(' GO TO BE2.                                  DMN1534
      ADD 1 TO BC.                                               DMN1535
      GO TO BE1.                                                 DMN1536
 BE2. IF A NOT = ')' GO TO BE3.                                  DMN1537
      SUBTRACT 1 FROM BC.                                        DMN1538
      GO TO BE1.                                                 DMN1539
 BE3. IF A NOT = '=' GO TO BE1.                                  DMN1540
      IF BC = 0 GO TO BE1.                                       DMN1541
      MOVE BC TO BC2.                                            DMN1542
 BE4. SUBTRACT 1 FROM CNPT.                                      DMN1543
      MOVE CN (CNPT) TO A.                                       DMN1544
      IF A NOT = '(' GO TO BE5.                                  DMN1545
      IF BC2 = BC GO TO BE50.                                    DMN1546
      SUBTRACT 1 FROM BC2.                                       DMN1547
      GO TO BE4.                                                 DMN1548
 BE5. IF A NOT = ')' GO TO BE4.                                  DMN1549
      ADD 1 TO BC2.                                              DMN1550
      GO TO BE4.                                                 DMN1551
 BE50. MOVE CNPT TO CNPT2.                                       DMN1552
      PERFORM PICK-UP-COND.                                      DMN1553
      MOVE CNPT2 TO CNPT3.                                       DMN1554
      SUBTRACT 1 FROM CNPT2.                                     DMN1555
      MOVE CN (CNPT2) TO A.                                      DMN1556
      IF A = ')' GO TO BE51.                                     DMN1557
 BE52. SUBTRACT 1 FROM CNPT2.                                    DMN1558
      IF CNPT2 = 6 GO TO BE60.                                   DMN1559
      MOVE CN (CNPT2) TO A.                                      DMN1560
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           IF A = ' ' GO TO BE52.                                    DMN1561
           IF A = '+' GO TO BE60.                                    DMN1562
           IF A = '-' GO TO BE60.                                    DMN1563
           IF A = '*' GO TO BE60.                                    DMN1564
           IF A = '/' GO TO BE60.                                    DMN1565
           IF A = '(' GO TO BE60.                                    DMN1566
           IF A = '=' GO TO BE60.                                    DMN1567
           GO TO BE52.                                               DMN1568
       BE51. SUBTRACT 1 FROM CNPT2.                                  DMN1569
           IF CN (CNPT2) NOT = '(' GO TO BE51.                       DMN1570
           GO TO BE52.                                               DMN1571
       BE60. MOVE 10 TO TMPT.                                        DMN1572
           MOVE CNPT2 TO CNPT4.                                      DMN1573
       BE61. ADD 1 TO TMPT.                                          DMN1574
           ADD 1 TO CNPT2.                                           DMN1575
           IF CNPT2 = CNPT3 GO TO BE62.                              DMN1576
           MOVE CN (CNPT2) TO TM (TMPT).                             DMN1577
           GO TO BE61.                                               DMN1578
       BE62. MOVE '$' TO TM (TMPT).                                  DMN1579
           MOVE COND-NM TO AL5.                                      DMN1580
           MOVE A5 (1) TO TM (1).                                    DMN1581
           MOVE A5 (2) TO TM (2).                                    DMN1582
           MOVE A5 (3) TO TM (3).                                    DMN1583
           MOVE A5 (4) TO TM (4).                                    DMN1584
           MOVE A5 (5) TO TM (5).                                    DMN1585
           ADD 1 TO SUBNM.                                           DMN1586
           MOVE SUBNM TO AL5.                                        DMN1587
           MOVE A5 (1) TO TM (6).                                    DMN1588
           MOVE A5 (2) TO TM (7).                                    DMN1589
           MOVE A5 (3) TO TM (8).                                    DMN1590
           MOVE A5 (4) TO TM (9).                                    DMN1591
           MOVE A5 (5) TO TM (10).                                   DMN1592
           MOVE 0 TO NR5.                                            DMN1593
           MOVE 1 TO PNU.                                            DMN1594
           MOVE CONDITION-CODE TO N.                                 DMN1595
       BE90. PERFORM UNPACK.                                         DMN1596
           IF PNU1 = 1 GO TO BE91.                                   DMN1597
           ADD 1 TO NR5.                                             DMN1598
           IF TR (1) NOT = '8' GO TO BE90.                           DMN1599
           MOVE 7 TO PTR.                                            DMN1600
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    MOVE 7 TO IFPT.                                          DMN1601
BE92. ADD 1 TO PTR.                                          DMN1602
    MOVE TR (PTR) TO A.                                      DMN1603
    ADD 1 TO IFPT.                                           DMN1604
    IF A NOT = IFA (IFPT) GO TO BE90.                        DMN1605
    IF A NOT = '$' GO TO BE92.                               DMN1606
    MOVE 'X' TO TM (1).                                      DMN1607
    SUBTRACT 1 FROM COND-NM.                                 DMN1608
    MOVE NRS TO DSN.                                         DMN1609
    MOVE 1 TO PNO.                                           DMN1610
    MOVE SUB-BC-CODE TO N.                                   DMN1611
BE93. PERFORM UNPACK.                                        DMN1612
    MOVE TR (1) TO A5 (1).                                   DMN1613
    MOVE TR (2) TO A5 (2).                                   DMN1614
    MOVE TR (3) TO A5 (3).                                   DMN1615
    MOVE TR (4) TO A5 (4).                                   DMN1616
    MOVE TR (5) TO A5 (5).                                   DMN1617
    IF AL5 NOT = DSN GO TO BE93.                             DMN1618
    PERFORM INSERT.                                          DMN1619
    GO TO BE94.                                              DMN1620
BE91. MOVE SUB-BC-CODE TO N.                                 DMN1621
    PERFORM PUT-AWAY.                                        DMN1622
    MOVE 'B' TO IFA (1).                                     DMN1623
    MOVE 'E' TO IFA (2).                                     DMN1624
    MOVE IFIF TO INTERMEDIATE.                               DMN1625
    MOVE CONDITION-CODE TO N.                                DMN1626
    PERFORM PUT-AWAY.                                        DMN1627
BE94. MOVE SUBNM TO AL5.                                     DMN1628
    MOVE CNPT4 TO CNPT3.                                     DMN1629
    ADD 1 TO CNPT3.                                          DMN1630
    MOVE 'O' TO CN (CNPT3).                                  DMN1631
    ADD 1 TO CNPT3.                                          DMN1632
    MOVE A5 (1) TO CN (CNPT3).                               DMN1633
    ADD 1 TO CNPT3.                                          DMN1634
    MOVE A5 (2) TO CN (CNPT3).                               DMN1635
    ADD 1 TO CNPT3.                                          DMN1636
    MOVE A5 (3) TO CN (CNPT3).                               DMN1637
    ADD 1 TO CNPT3.                                          DMN1638
    MOVE A5 (4) TO CN (CNPT3).                               DMN1639
    ADD 1 TO CNPT3.                                          DMN1640
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    MOVE A5 (5) TO CN (CNPT3).                                          DMN1641
BE65. IF CNPT = CNPT3 GO TO BE1.                                        DMN1642
    ADD 1 TO CNPT3.                                                     DMN1643
    MOVE ' ' TO CN (CNPT3).                                             DMN1644
    GO TO BE65.                                                         DMN1645
BE70. MOVE '$' TO CN (CNPT).                                            DMN1646
    MOVE 5 TO TMPT.                                                     DMN1647
    MOVE BC-NM TO AL5.                                                  DMN1648
    MOVE A5 (1) TO TM (1).                                              DMN1649
    MOVE A5 (2) TO TM (2).                                              DMN1650
    MOVE A5 (3) TO TM (3).                                              DMN1651
    MOVE A5 (4) TO TM (4).                                              DMN1652
    MOVE A5 (5) TO TM (5).                                              DMN1653
BE71. ADD 1 TO TMPT.                                                    DMN1654
    ADD 1 TO CNPT.                                                      DMN1655
    MOVE CN (CNPT) TO TM (TMPT).                                        DMN1656
    IF CN (CNPT) NOT = '$' GO TO BE71.                                  DMN1657
    MOVE TOLERANCE-CODE TO N.                                           DMN1658
    PERFORM PUT-AWAY.                                                   DMN1659
    MOVE 1 TO TOL-D.                                                    DMN1660
BE99. MOVE '      ON(00000)=          ' TO INTERMEDIATE.                DMN1661
    MOVE BC-NM TO AL5.                                                  DMN1662
    MOVE A5 (1) TO TM (10).                                             DMN1663
    MOVE A5 (2) TO TM (11).                                             DMN1664
    MOVE A5 (3) TO TM (12).                                             DMN1665
    MOVE A5 (4) TO TM (13).                                             DMN1666
    MOVE A5 (5) TO TM (14).                                             DMN1667
    MOVE 6 TO CNPT.                                                     DMN1668
    MOVE 16 TO TMPT.                                                    DMN1669
BE991. ADD 1 TO CNPT.                                                   DMN1670
    MOVE CN (CNPT) TO A.                                                DMN1671
    IF A = '=' GO TO BE992.                                             DMN1672
    IF A = '$' GO TO BE993.                                             DMN1673
    ADD 1 TO TMPT.                                                      DMN1674
    MOVE A TO TM (TMPT).                                                DMN1675
    GO TO BE991.                                                        DMN1676
BE992. ADD 1 TO TMPT.                                                   DMN1677
    MOVE '-' TO TM (TMPT).                                              DMN1678
    ADD 1 TO TMPT.                                                      DMN1679
    MOVE '(' TO TM (TMPT).                                              DMN1680
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      GO TO BE991.                                          DMN1681
BE993. ADD 1 TO TMPT.                                       DMN1682
      MOVE ')' TO TM (TMPT).                                DMN1683
      ADD 1 TO TMPT.                                        DMN1684
      MOVE '$' TO TM (TMPT).                                DMN1685
      MOVE BOUND-EQ-CODE TO N.                              DMN1686
      PERFORM PUT-AWAY.                                     DMN1687
      GO TO PHA2.                                           DMN1688
      NOTE FINISH BOUNDARY-EQUATION.                        DMN1689
INTAKE-METHOD SECTION.                                      DMN1690
MET. MOVE ZERO TO TEMP-REG.                                 DMN1691
      MOVE ZERO TO DFIVE.                                   DMN1692
      MOVE ZERO TO PERM-REG.                                DMN1693
      MOVE 'R' TO PC.                                       DMN1694
      MOVE ' ' TO TM (1).                                   DMN1695
      MOVE ' ' TO TM (2).                                   DMN1696
      MOVE ' ' TO TM (3).                                   DMN1697
      MOVE ' ' TO TM (4).                                   DMN1698
      MOVE ' ' TO TM (5).                                   DMN1699
      MOVE 'S' TO TM (6).                                   DMN1700
      MOVE 6 TO CNPT.                                       DMN1701
      MOVE SPACES TO REG9.                                  DMN1702
MET1. ADD 1 TO CNPT.                                        DMN1703
      IF CN (CNPT) NOT = '(' GO TO MET1.                    DMN1704
MET2. ADD 1 TO CNPT.                                        DMN1705
      MOVE CN (CNPT) TO A.                                  DMN1706
      IF A = ')' GO TO MET3.                                DMN1707
      PERFORM R9LEFT.                                       DMN1708
      MOVE A TO R9 (9).                                     DMN1709
      GO TO MET2.                                           DMN1710
MET3. PERFORM R9LEFT-JUSTIFY.                               DMN1711
      MOVE REG9 TO MET-NAME.                                DMN1712
      MOVE R9 (1) TO TM (7).                                DMN1713
      MOVE R9 (2) TO TM (8).                                DMN1714
      MOVE R9 (3) TO TM (9).                                DMN1715
      MOVE R9 (4) TO TM (10).                               DMN1716
      MOVE R9 (5) TO TM (11).                               DMN1717
      MOVE R9 (6) TO TM (12).                               DMN1718
      MOVE R9 (7) TO TM (13).                               DMN1719
      MOVE R9 (8) TO TM (14).                               DMN1720
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           MOVE R9 (9) TO TM (15).                                  DMN1721
           MOVE ' ' TO TM (16).                                     DMN1722
           MOVE ' ' TO TM (17).                                     DMN1723
           MOVE ' ' TO TM (18).                                     DMN1724
           MOVE ' ' TO TM (19).                                     DMN1725
           MOVE ' ' TO TM (20).                                     DMN1726
           MOVE ' ' TO TM (21).                                     DMN1727
           MOVE ' ' TO TM (22).                                     DMN1728
           MOVE ' ' TO TM (23).                                     DMN1729
           MOVE ' ' TO TM (24).                                     DMN1730
           MOVE ' ' TO TM (25).                                     DMN1731
           MOVE ' ' TO TM (26).                                     DMN1732
           MOVE '$' TO TM (27).                                     DMN1733
           MOVE METHOD-CODE TO N.                                   DMN1734
           PERFORM PUT-AWAY.                                        DMN1735
           MOVE 'LOOP      ' TO TEST.                               DMN1736
       MET4. IF END-OF-PHASE GO TO MET5.                            DMN1737
           PERFORM CONT-READ.                                       DMN1738
           PERFORM SCAN-CARD.                                       DMN1739
           IF EQ NOT = 1 GO TO MET4A.                               DMN1740
           PERFORM FUNCARD.                                         DMN1741
           IF FNC GO TO MET4.                                       DMN1742
           GO TO MET41.                                             DMN1743
      MET4A. IF REG3 = 'CAL' GO TO MET61.                           DMN1744
           IF REG3 = 'ALL' GO TO MET6.                              DMN1745
           IF REG3 = 'RES' GO TO MET7.                              DMN1746
           GO TO MET41.                                             DMN1747
       MET6. PERFORM OPERAND.                                       DMN1748
           ADD OP-COUNT TO PERM-REG.                                DMN1749
           GO TO MET41.                                             DMN1750
       MET7. PERFORM OPERAND.                                       DMN1751
           SUBTRACT OP-COUNT FROM PERM-REG.                         DMN1752
           GO TO MET41.                                             DMN1753
      MET41. MOVE CNCN TO INTERMEDIATE.                             DMN1754
           MOVE METHOD-CODE TO N.                                   DMN1755
           PERFORM PUT-AWAY.                                        DMN1756
           GO TO MET4.                                              DMN1757
      MET61. MOVE 'P' TO PC.                                        DMN1758
           MOVE 0 TO DSC-FND.                                       DMN1759
           MOVE SPACES TO IFIF.                                     DMN1760
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      MOVE '      ROTATE' TO IFIF.                                  DMN1761
      MOVE 12 TO IFPT.                                              DMN1762
      MOVE 6 TO CNPT.                                               DMN1763
MET62. ADD 1 TO CNPT.                                               DMN1764
      IF CN (CNPT) NOT = '(' GO TO MET62.                           DMN1765
      PERFORM MET63.                                                DMN1766
      IF REG9 = 'N1       ' GO TO MET65.                            DMN1767
      MOVE 1 TO DSC-FND.                                            DMN1768
      PERFORM MET641.                                               DMN1769
MET642. ADD 1 TO IFPT.                                              DMN1770
      MOVE 'N' TO IFA (IFPT).                                       DMN1771
      ADD 1 TO IFPT.                                                DMN1772
      MOVE '1' TO IFA (IFPT).                                       DMN1773
      ADD 1 TO IFPT.                                                DMN1774
      MOVE ')' TO IFA (IFPT).                                       DMN1775
MET65. PERFORM MET63.                                               DMN1776
      IF REG9 = 'NF1      ' GO TO MET66.                            DMN1777
      MOVE 1 TO DSC-FND.                                            DMN1778
      PERFORM MET641.                                               DMN1779
      ADD 1 TO IFPT.                                                DMN1780
      MOVE 'N' TO IFA (IFPT).                                       DMN1781
      ADD 1 TO IFPT.                                                DMN1782
      MOVE 'F' TO IFA (IFPT).                                       DMN1783
      ADD 1 TO IFPT.                                                DMN1784
      MOVE '1' TO IFA (IFPT).                                       DMN1785
      ADD 1 TO IFPT.                                                DMN1786
      MOVE ')' TO IFA (IFPT).                                       DMN1787
MET66. PERFORM MET63.                                               DMN1788
      IF REG9 = 'N2       ' GO TO MET67.                            DMN1789
      MOVE 1 TO DSC-FND.                                            DMN1790
      PERFORM MET641.                                               DMN1791
      ADD 1 TO IFPT.                                                DMN1792
      MOVE 'N' TO IFA (IFPT).                                       DMN1793
      ADD 1 TO IFPT.                                                DMN1794
      MOVE '2' TO IFA (IFPT).                                       DMN1795
      ADD 1 TO IFPT.                                                DMN1796
      MOVE ')' TO IFA (IFPT).                                       DMN1797
MET67. PERFORM MET63.                                               DMN1798
      IF REG9 = 'NF2      ' GO TO MET68.                            DMN1799
      MOVE 1 TO DSC-FND.                                            DMN1800
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           PERFORM MET641.                                          DMN1801
           ADD 1 TO IFPT.                                           DMN1802
           MOVE 'N' TO IFA (IFPT).                                  DMN1803
           ADD 1 TO IFPT.                                           DMN1804
           MOVE 'F' TO IFA (IFPT).                                  DMN1805
           ADD 1 TO IFPT.                                           DMN1806
           MOVE '2' TO IFA (IFPT).                                  DMN1807
           ADD 1 TO IFPT.                                           DMN1808
           MOVE ')' TO IFA (IFPT).                                  DMN1809
       MET68. ADD 1 TO IFPT.                                        DMN1810
           MOVE '$' TO IFA (IFPT).                                  DMN1811
           MOVE METHOD-CODE TO N.                                   DMN1812
           IF DSC-FND = 0 GO TO MET681.                             DMN1813
           MOVE IFIF TO INTERMEDIATE.                               DMN1814
           PERFORM PUT-AWAY.                                        DMN1815
       MET681. MOVE '      CAL$                 ' TO INTERMEDIATE.  DMN1816
           PERFORM PUT-AWAY.                                        DMN1817
           IF DSC-FND = 0 GO TO MET682.                             DMN1818
           MOVE IFIF TO INTERMEDIATE.                               DMN1819
           PERFORM PUT-AWAY.                                        DMN1820
       MET682. GO TO MET4.                                          DMN1821
       MET5. MOVE 'END      ' TO TEST.                              DMN1822
           PERFORM CONT-READ.                                       DMN1823
           MOVE CNCN TO INTERMEDIATE.                               DMN1824
           MOVE METHOD-CODE TO N.                                   DMN1825
           PERFORM PUT-AWAY.                                        DMN1826
       MET51. IF END-OF-PHASE GO TO MET52.                          DMN1827
           PERFORM CONT-READ.                                       DMN1828
           PERFORM SCAN-CARD.                                       DMN1829
           IF EQ NOT = 1 GO TO MET51A.                              DMN1830
           PERFORM FUNCARD.                                         DMN1831
           IF FNC GO TO MET51.                                      DMN1832
           GO TO MET53.                                             DMN1833
       MET51A. IF REG3 = 'ALL' GO TO MET54.                         DMN1834
           IF REG3 = 'RES' GO TO MET55.                             DMN1835
       MET53. MOVE CNCN TO INTERMEDIATE.                            DMN1836
           MOVE METHOD-CODE TO N.                                   DMN1837
           PERFORM PUT-AWAY.                                        DMN1838
           GO TO MET51.                                             DMN1839
       MET54. PERFORM OPERAND.                                      DMN1840
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      ADD OP-COUNT TO DFIVE.                                          DMN1841
      IF DFIVE GREATER THAN TEMP-REG MOVE DFIVE TO TEMP-REG.          DMN1842
      GO TO MET53.                                                    DMN1843
MET55. PERFORM OPERAND.                                               DMN1844
      SUBTRACT OP-COUNT FROM DFIVE.                                   DMN1845
      GO TO MET53.                                                    DMN1846
REG-ERA. MOVE 'C REGISTERS DO NOT BALANCE                           ' DMN1847
            TO OUTCARD.                                               DMN1848
      PERFORM WRITE-OUT.                                              DMN1849
      MOVE ZERO TO DFIVE.                                             DMN1850
MET52. IF DFIVE NOT = 0 GO TO REG-ERA.                                DMN1851
      MOVE INCARD TO INTERMEDIATE.                                    DMN1852
      MOVE METHOD-CODE TO N.                                          DMN1853
      PERFORM PUT-AWAY.                                               DMN1854
      MOVE 1 TO PNU.                                                  DMN1855
MET56. PERFORM UNPACK.                                                DMN1856
      IF PNU1 = 1 DISPLAY 'COMP ERR'.                                 DMN1857
      IF TR (6) NOT = 'S' GO TO MET56.                                DMN1858
      MOVE TR (7) TO R9 (1).                                          DMN1859
      MOVE TR (8) TO R9 (2).                                          DMN1860
      MOVE TR (9) TO R9 (3).                                          DMN1861
      MOVE TR (10) TO R9 (4).                                         DMN1862
      MOVE TR (11) TO R9 (5).                                         DMN1863
      MOVE TR (12) TO R9 (6).                                         DMN1864
      MOVE TR (13) TO R9 (7).                                         DMN1865
      MOVE TR (14) TO R9 (8).                                         DMN1866
      MOVE TR (15) TO R9 (9).                                         DMN1867
      IF REG9 NOT = MET-NAME GO TO MET56.                             DMN1868
      MOVE PC TO TR (16).                                             DMN1869
      MOVE PERM-REG TO AL5.                                           DMN1870
      MOVE A5 (1) TO TR (17).                                         DMN1871
      MOVE A5 (2) TO TR (18).                                         DMN1872
      MOVE A5 (3) TO TR (19).                                         DMN1873
      MOVE A5 (4) TO TR (20).                                         DMN1874
      MOVE A5 (5) TO TR (21).                                         DMN1875
      MOVE TEMP-REG TO AL5.                                           DMN1876
      MOVE A5 (1) TO TR (22).                                         DMN1877
      MOVE A5 (2) TO TR (23).                                         DMN1878
      MOVE A5 (3) TO TR (24).                                         DMN1879
      MOVE A5 (4) TO TR (25).                                         DMN1880
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    MOVE A5 (5) TO TR (26).                                    DMN1881
    PERFORM REPLACE.                                           DMN1882
    NOTE FINISH INTAKE-METHOD.                                 DMN1883
MET63 SECTION.                                                 DMN1884
MET63A. MOVE SPACES TO REG9.                                   DMN1885
MET63B. ADD 1 TO CNPT.                                         DMN1886
    MOVE CN (CNPT) TO A.                                       DMN1887
    IF A = ',' GO TO MET64.                                    DMN1888
    IF A = ')' GO TO MET64.                                    DMN1889
    IF A = '$' GO TO MET64.                                    DMN1890
    PERFORM R9LEFT.                                            DMN1891
    MOVE A TO R9 (9).                                          DMN1892
    GO TO MET63B.                                              DMN1893
MET64. PERFORM R9LEFT-JUSTIFY.                                 DMN1894
    NOTE FINISH MET63.                                         DMN1895
MET641 SECTION.                                                DMN1896
MET641A. ADD 1 TO IFPT.                                        DMN1897
    MOVE '(' TO IFA (IFPT).                                    DMN1898
    ADD 1 TO IFPT.                                             DMN1899
    MOVE R9 (1) TO IFA (IFPT).                                 DMN1900
    ADD 1 TO IFPT.                                             DMN1901
    MOVE R9 (2) TO IFA (IFPT).                                 DMN1902
    ADD 1 TO IFPT.                                             DMN1903
    MOVE R9 (3) TO IFA (IFPT).                                 DMN1904
    ADD 1 TO IFPT.                                             DMN1905
    MOVE R9 (4) TO IFA (IFPT).                                 DMN1906
    ADD 1 TO IFPT.                                             DMN1907
    MOVE R9 (5) TO IFA (IFPT).                                 DMN1908
    ADD 1 TO IFPT.                                             DMN1909
    MOVE R9 (6) TO IFA (IFPT).                                 DMN1910
    ADD 1 TO IFPT.                                             DMN1911
    MOVE R9 (7) TO IFA (IFPT).                                 DMN1912
    ADD 1 TO IFPT.                                             DMN1913
    MOVE R9 (8) TO IFA (IFPT).                                 DMN1914
    ADD 1 TO IFPT.                                             DMN1915
    MOVE R9 (9) TO IFA (IFPT).                                 DMN1916
    ADD 1 TO IFPT.                                             DMN1917
    MOVE ',' TO IFA (IFPT).                                    DMN1918
    NOTE FINISH MET641.                                        DMN1919
OPERAND SECTION.                                               DMN1920
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OS. MOVE ZERO TO OP-COUNT.                                    DMN1921
    MOVE 6 TO CNPT.                                           DMN1922
OS1. ADD 1 TO CNPT.                                           DMN1923
    MOVE CN (CNPT) TO A.                                      DMN1924
    IF A = '$' GO TO OSX.                                     DMN1925
    IF A NOT = '(' GO TO OS1.                                 DMN1926
    ADD 1 TO OP-COUNT.                                        DMN1927
OS2. ADD 1 TO CNPT.                                           DMN1928
    MOVE CN (CNPT) TO A.                                      DMN1929
    IF A = ',' ADD 1 TO OP-COUNT.                             DMN1930
    IF A NOT = ')' GO TO OS2.                                 DMN1931
    GO TO OS1.                                                DMN1932
OSX. EXIT.                                                    DMN1933
    NOTE FINISH OPERAND.                                      DMN1934
FUNCARD SECTION.                                              DMN1935
FNCD. MOVE 0 TO FNCDG.                                        DMN1936
    MOVE 6 TO CNPT.                                           DMN1937
FNCD1. ADD 1 TO CNPT.                                         DMN1938
    IF CN (CNPT) NOT = '=' GO TO FNCD1.                       DMN1939
    MOVE SPACES TO REG9.                                      DMN1940
FNCD2. ADD 1 TO CNPT.                                         DMN1941
    MOVE CN (CNPT) TO A.                                      DMN1942
    IF A = '$' GO TO FNCDX.                                   DMN1943
    IF A = '(' GO TO FNCD3.                                   DMN1944
    PERFORM R9LEFT.                                           DMN1945
    MOVE A TO R9 (9).                                         DMN1946
    GO TO FNCD2.                                              DMN1947
FNCD3. IF REG9 = '         ' GO TO FNCDX.                     DMN1948
    PERFORM R9LEFT-JUSTIFY.                                   DMN1949
    IF REG9 NOT = 'FUNCTION' GO TO FNCDX.                     DMN1950
    MOVE 0 TO DSC-FND.                                        DMN1951
    MOVE 1 TO FNCDG.                                          DMN1952
FNCD4. ADD 1 TO CNPT.                                         DMN1953
    IF CN (CNPT) NOT = ')' GO TO FNCD4.                       DMN1954
    MOVE SPACES TO IFIF.                                      DMN1955
    MOVE '      ROTATE' TO IFIF.                              DMN1956
    MOVE 12 TO IFPT.                                          DMN1957
FNCD5. SUBTRACT 1 FROM CNPT.                                  DMN1958
    MOVE CN (CNPT) TO A.                                      DMN1959
    IF A = ',' GO TO FNCD6.                                   DMN1960
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    IF A NOT = '(' GO TO FNCD5.                                    DMN1961
FNCD6. PERFORM MET63.                                              DMN1962
    IF REG9 = 'N2       ' GO TO FNCD7.                             DMN1963
    MOVE 1 TO DSC-FND.                                             DMN1964
    PERFORM MET641.                                                DMN1965
    ADD 1 TO IFPT.                                                 DMN1966
    MOVE 'N' TO IFA (IFPT).                                        DMN1967
    ADD 1 TO IFPT.                                                 DMN1968
    MOVE '2' TO IFA (IFPT).                                        DMN1969
    ADD 1 TO IFPT.                                                 DMN1970
    MOVE ')' TO IFA (IFPT).                                        DMN1971
FNCD7. MOVE 6 TO CNPT.                                             DMN1972
FNCD71. ADD 1 TO CNPT.                                             DMN1973
    IF CN (CNPT) NOT = ',' GO TO FNCD71.                           DMN1974
    PERFORM MET63.                                                 DMN1975
    IF REG9 = 'NF2      ' GO TO FNCD8.                             DMN1976
    MOVE 1 TO DSC-FND.                                             DMN1977
    PERFORM MET641.                                                DMN1978
    ADD 1 TO IFPT.                                                 DMN1979
    MOVE 'N' TO IFA (IFPT).                                        DMN1980
    ADD 1 TO IFPT.                                                 DMN1981
    MOVE 'F' TO IFA (IFPT).                                        DMN1982
    ADD 1 TO IFPT.                                                 DMN1983
    MOVE '2' TO IFA (IFPT).                                        DMN1984
    ADD 1 TO IFPT.                                                 DMN1985
    MOVE ')' TO IFA (IFPT).                                        DMN1986
FNCD8. ADD 1 TO IFPT.                                              DMN1987
    MOVE '$' TO IFA (IFPT).                                        DMN1988
    MOVE METHOD-CODE TO N.                                         DMN1989
    IF DSC-FND = 0 GO TO FNCD81.                                   DMN1990
    MOVE IFIF TO INTERMEDIATE.                                     DMN1991
    PERFORM PUT-AWAY.                                              DMN1992
FNCD81. MOVE '      FUN$                ' TO INTERMEDIATE.         DMN1993
    PERFORM PUT-AWAY.                                              DMN1994
    IF DSC-FND = 0 GO TO FNCDX.                                    DMN1995
    MOVE IFIF TO INTERMEDIATE.                                     DMN1996
    PERFORM PUT-AWAY.                                              DMN1997
FNCDX. EXIT.                                                       DMN1998
    NOTE FINISH FUNCARD.                                           DMN1999
LOAD-STANDARD-METHOD SECTION.                                      DMN2000
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 LSM. MOVE METHOD-CODE TO N.                                              DMN2001
     MOVE '     SRK2      R0000000002$                          ' TO     DMN2002
           INTERMEDIATE.                                                  DMN2003
     PERFORM PUT-AWAY.                                                    DMN2004
     MOVE '      FUN$                ' TO INTERMEDIATE.                  DMN2005
     PERFORM PUT-AWAY.                                                    DMN2006
     MOVE '      LOOP$               ' TO INTERMEDIATE.                  DMN2007
     PERFORM PUT-AWAY.                                                    DMN2008
     MOVE ' 4800 ROTATE(N1,N2)(NF1,NF2)$                          ' TO    DMN2009
           INTERMEDIATE.                                                  DMN2010
     PERFORM PUT-AWAY.                                                    DMN2011
     MOVE ' 4801 ALLOT(MP,MK2)$    ' TO INTERMEDIATE.                     DMN2012
     PERFORM PUT-AWAY.                                                    DMN2013
     MOVE '      DO 4802 NK=1,NDE$ ' TO INTERMEDIATE.                     DMN2014
     PERFORM PUT-AWAY.                                                    DMN2015
     MOVE ' 4802 OY(NK,MP)=OY(NK,N1)+STEP*OY(NK,NF1)$             ' TO    DMN2016
           INTERMEDIATE.                                                  DMN2017
     PERFORM PUT-AWAY.                                                    DMN2018
     MOVE '      ROTATE(MP,N2)(MK2,NF2)$                          ' TO    DMN2019
           INTERMEDIATE.                                                  DMN2020
     PERFORM PUT-AWAY.                                                    DMN2021
     MOVE '      FUN$                ' TO INTERMEDIATE.                  DMN2022
     PERFORM PUT-AWAY.                                                    DMN2023
     MOVE '      ROTATE(MP,N2)(MK2,NF2)$                          ' TO    DMN2024
           INTERMEDIATE.                                                  DMN2025
     PERFORM PUT-AWAY.                                                    DMN2026
     MOVE '      DO 4803 NK=1,NDE$ ' TO INTERMEDIATE.                     DMN2027
     PERFORM PUT-AWAY.                                                    DMN2028
     MOVE ' 4803 OY(NK,N2)=OY(NK,N1)+ 5*STEP*(OY(NK,NF1)+OY(NK,MK2        DMN2029
-'))$               ' TO INTERMEDIATE.                                    DMN2030
     PERFORM PUT-AWAY.                                                    DMN2031
     MOVE '      RESTORE(MP,MK2)$  ' TO INTERMEDIATE.                     DMN2032
     PERFORM PUT-AWAY.                                                    DMN2033
     MOVE '      FUN$                ' TO INTERMEDIATE.                  DMN2034
     PERFORM PUT-AWAY.                                                    DMN2035
     MOVE '      END$                ' TO INTERMEDIATE.                  DMN2036
     PERFORM PUT-AWAY.                                                    DMN2037
     NOTE FINISH LOAD-STANDARD-METHOD.                                    DMN2038
 FIND-METHOD SECTION.                                                     DMN2039
 LUM. MOVE METHOD-CODE TO N.                                              DMN2040
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    MOVE 1 TO PNU.                                          DMN2041
PH43. PERFORM UNPACK.                                       DMN2042
    IF PNU1 = 1 GO TO FNDMETXT.                             DMN2043
    IF TR (6) NOT = 'S' GO TO PH43.                         DMN2044
    IF TR (07) NOT = R9 (1) GO TO PH43.                     DMN2045
    IF TR (08) NOT = R9 (2) GO TO PH43.                     DMN2046
    IF TR (09) NOT = R9 (3) GO TO PH43.                     DMN2047
    IF TR (10) NOT = R9 (4) GO TO PH43.                     DMN2048
    IF TR (11) NOT = R9 (5) GO TO PH43.                     DMN2049
    IF TR (12) NOT = R9 (6) GO TO PH43.                     DMN2050
    IF TR (13) NOT = R9 (7) GO TO PH43.                     DMN2051
    IF TR (14) NOT = R9 (8) GO TO PH43.                     DMN2052
    IF TR (15) NOT = R9 (9) GO TO PH43.                     DMN2053
FNDMETXT. EXIT.                                             DMN2054
    NOTE FINISH FIND-METHOD.                                DMN2055
LOOK-UP-METHOD SECTION.                                     DMN2056
LUMMM. PERFORM FIND-METHOD.                                 DMN2057
    IF PNU1 = 1 GO TO PH431.                                DMN2058
    MOVE TR (16) TO MTYPE.                                  DMN2059
    MOVE TR (17) TO A5 (1).                                 DMN2060
    MOVE TR (18) TO A5 (2).                                 DMN2061
    MOVE TR (19) TO A5 (3).                                 DMN2062
    MOVE TR (20) TO A5 (4).                                 DMN2063
    MOVE TR (21) TO A5 (5).                                 DMN2064
    PERFORM AL5-NM5.                                        DMN2065
    MOVE NM5 TO PERM-REG.                                   DMN2066
    MOVE TR (22) TO A5 (1).                                 DMN2067
    MOVE TR (23) TO A5 (2).                                 DMN2068
    MOVE TR (24) TO A5 (3).                                 DMN2069
    MOVE TR (25) TO A5 (4).                                 DMN2070
    MOVE TR (26) TO A5 (5).                                 DMN2071
    PERFORM AL5-NM5.                                        DMN2072
    MOVE NM5 TO TEMP-REG.                                   DMN2073
    GO TO LUMX.                                             DMN2074
PH431. MOVE 'RK2      ' TO REG9.                            DMN2075
    GO TO LUMMM.                                            DMN2076
LUMX. EXIT.                                                 DMN2077
    NOTE FINISH LOOK-UP-METHOD.                             DMN2078
DET-IF-DIFF SECTION.                                        DMN2079
S3. IF R9 (1) IS NOT EQUAL TO 'D' GO TO S2.                 DMN2080
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      PERFORM R9LEFT.                                                    DMN2081
      MOVE '0' TO R2 (1).                                                DMN2082
      MOVE '1' TO R2 (2).                                                DMN2083
      MOVE R9 (1) TO B, PERFORM NTEST, IF NOT NUMBER GO TO S1.           DMN2084
      MOVE R9 (1) TO R2 (2).                                             DMN2085
      PERFORM R9LEFT.                                                    DMN2086
      MOVE R9 (1) TO B, PERFORM NTEST, IF NOT NUMBER GO TO S1.           DMN2087
      MOVE R2 (2) TO R2 (1).                                             DMN2088
      MOVE R9 (1) TO R2 (2).                                             DMN2089
      PERFORM R9LEFT.                                                    DMN2090
 S1.  MOVE R9 (1) TO B, PERFORM ATEST, IF NOT ALPHA GO TO S2.            DMN2091
      MOVE R9 (1) TO A.                                                  DMN2092
      PERFORM FIXED-POINT-TEST.                                          DMN2093
      IF FIXED-POINT GO TO S2.                                           DMN2094
      MOVE 1 TO DID.                                                     DMN2095
      GO TO S4.                                                          DMN2096
 S2.  MOVE 0 TO DID.                                                     DMN2097
 S4.  EXIT.                                                              DMN2098
      NOTE FINISH DET-IF-DIFF.                                           DMN2099
 DIM-CARD SECTION.                                                       DMN2100
 D1.  MOVE SPACES TO REG9.                                               DMN2101
      MOVE 6 TO CNPT.                                                    DMN2102
 D11. ADD 1 TO CNPT.                                                     DMN2103
      MOVE CN (CNPT) TO A.                                               DMN2104
      IF A = ' ' GO TO D11.                                              DMN2105
      IF R9 (1) NOT = ' ' GO TO D12.                                     DMN2106
      IF A = '$' GO TO D1X.                                              DMN2107
      PERFORM R9LEFT.                                                    DMN2108
      MOVE A TO R9 (9).                                                  DMN2109
      GO TO D11.                                                         DMN2110
 D12. IF REG9 NOT = 'DIMENSION' GO TO D1X.                               DMN2111
      MOVE 0 TO PAD.                                                     DMN2112
      SUBTRACT 1 FROM CNPT.                                              DMN2113
 DE.  MOVE SPACES TO TB1.                                                DMN2114
 D13. ADD 1 TO CNPT.                                                     DMN2115
      MOVE CN (CNPT) TO A.                                               DMN2116
      IF A = ' ' GO TO D13.                                              DMN2117
      IF A = '(' GO TO D14A.                                             DMN2118
      PERFORM TBL1LEFT.                                                  DMN2119
      MOVE A TO TBL1 (9).                                                DMN2120
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    GO TO D13.                                              DMN2121
D14A. IF TBL1 (9) = ' ' GO TO D1X.                          DMN2122
D14. IF TBL1 (1) NOT = ' ' GO TO D15.                       DMN2123
    PERFORM TBL1LEFT.                                       DMN2124
    GO TO D14.                                              DMN2125
D15. MOVE 0 TO TBPT2.                                       DMN2126
DB. ADD 1 TO TBPT2.                                         DMN2127
    MOVE '00000' TO TBL3 (TBPT2).                           DMN2128
DCC. ADD 1 TO CNPT.                                         DMN2129
    MOVE CN (CNPT) TO A.                                    DMN2130
    IF A = ' ' GO TO DCC.                                   DMN2131
    IF A = ',' GO TO DB.                                    DMN2132
    IF A = ')' GO TO D17.                                   DMN2133
    MOVE TBL3 (TBPT2) TO Z5.                                DMN2134
    MOVE Z4 TO TBL3 (TBPT2).                                DMN2135
    MOVE A TO TBL3S (TBPT2, 5).                             DMN2136
    GO TO DCC.                                              DMN2137
D17. ADD 1 TO TBPT2.                                        DMN2138
    MOVE '    $' TO TBL3 (TBPT2).                           DMN2139
    MOVE TB1 TO REG9.                                       DMN2140
    PERFORM DET-IF-DIFF.                                    DMN2141
    MOVE REG9 TO TB1.                                       DMN2142
    MOVE TABLE-AREA TO INTERMEDIATE.                        DMN2143
    MOVE DIM-CODE TO N.                                     DMN2144
    PERFORM PUT-AWAY.                                       DMN2145
DD. ADD 1 TO CNPT.                                          DMN2146
    MOVE CN (CNPT) TO A.                                    DMN2147
    IF A = '$' GO TO D1X.                                   DMN2148
    IF A NOT = ',' GO TO DD.                                DMN2149
    GO TO DE.                                               DMN2150
D1X. EXIT.                                                  DMN2151
    NOTE FINISH DIM-CARD.                                   DMN2152
DO-PROCESS SECTION.                                         DMN2153
D2. MOVE 6 TO CNPT.                                         DMN2154
DF. ADD  1 TO CNPT.                                         DMN2155
    IF CN (CNPT) NOT = '0' GO TO DF.                        DMN2156
    MOVE ZERO TO OR-DO.                                     DMN2157
D21. ADD 1 TO CNPT.                                         DMN2158
    MOVE CN (CNPT) TO A.                                    DMN2159
    IF A = ' ' GO TO D21.                                   DMN2160
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     MOVE A TO B, PERFORM NTEST, IF NOT NUMBER GO TO D22.      DMN2161
     MOVE ORD (2) TO ORD (1).                                  DMN2162
     MOVE ORD (3) TO ORD (2).                                  DMN2163
     MOVE ORD (4) TO ORD (3).                                  DMN2164
     MOVE ORD (5) TO ORD (4).                                  DMN2165
     MOVE A TO ORD (5).                                        DMN2166
     GO TO D21.                                                DMN2167
D22. IF ORD (5) = ' ' GO TO D2X.                               DMN2168
     MOVE CN (CNPT) TO A.                                      DMN2169
     PERFORM FIXED-POINT-TEST.                                 DMN2170
     IF FXD = 0 GO TO D2X.                                     DMN2171
     MOVE 0 TO PAD.                                            DMN2172
     MOVE 1 TO PNU.                                            DMN2173
     MOVE DO-TABLE-CODE TO N.                                  DMN2174
DZ.  PERFORM UNPACK.                                           DMN2175
     IF PNU1 = 1 GO TO DZ1.                                    DMN2176
     IF TR (1) NOT = ORD (1) GO TO DZ.                         DMN2177
     IF TR (2) NOT = ORD (2) GO TO DZ.                         DMN2178
     IF TR (3) NOT = ORD (3) GO TO DZ.                         DMN2179
     IF TR (4) NOT = ORD (4) GO TO DZ.                         DMN2180
     IF TR (5) NOT = ORD (5) GO TO DZ.                         DMN2181
     MOVE TR (6) TO NED (1).                                   DMN2182
     MOVE TR (7) TO NED (2).                                   DMN2183
     MOVE TR (8) TO NED (3).                                   DMN2184
     MOVE TR (9) TO NED (4).                                   DMN2185
     MOVE TR (10) TO NED (5).                                  DMN2186
     GO TO DZ2.                                                DMN2187
DZ1. ADD 1 TO AVAILABLE-SNM.                                   DMN2188
     MOVE AVAILABLE-SNM TO NEW-DO.                             DMN2189
     MOVE DO-TABLE-CODE TO N.                                  DMN2190
     MOVE DO-NUM TO INTERMEDIATE.                              DMN2191
     PERFORM PUT-AWAY.                                         DMN2192
DZ2. MOVE FUNCTION-CARDS-CODE TO N.                            DMN2193
     MOVE CN (1) TO TM (1).                                    DMN2194
     MOVE CN (2) TO TM (2).                                    DMN2195
     MOVE CN (3) TO TM (3).                                    DMN2196
     MOVE CN (4) TO TM (4).                                    DMN2197
     MOVE CN (5) TO TM (5).                                    DMN2198
     MOVE CN (6) TO TM (6).                                    DMN2199
     MOVE 'D' TO TM (7).                                       DMN2200
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        MOVE '0' TO TM (8).                                          DMN2201
        MOVE NED (1) TO TM (09).                                     DMN2202
        MOVE NED (2) TO TM (10).                                     DMN2203
        MOVE NED (3) TO TM (11).                                     DMN2204
        MOVE NED (4) TO TM (12).                                     DMN2205
        MOVE NED (5) TO TM (13).                                     DMN2206
        MOVE 13 TO TMPT.                                             DMN2207
        SUBTRACT 1 FROM CNPT.                                        DMN2208
    D23. ADD 1 TO CNPT.                                              DMN2209
        ADD 1 TO TMPT.                                               DMN2210
        MOVE CN (CNPT) TO TM (TMPT).                                 DMN2211
        IF CN (CNPT) NOT = '$' GO TO D23.                            DMN2212
        PERFORM PUT-AWAY.                                            DMN2213
    D2X. EXIT.                                                       DMN2214
        NOTE FINISH DO-PROCESS.                                      DMN2215
    IFCARD SECTION.                                                  DMN2216
    D3. MOVE CNCN TO IFIF.                                           DMN2217
        ALTER IFSWITCH TO PROCEED TO IFRETURN.                       DMN2218
        ALTER IFSWITCH2 TO PROCEED TO IFRETURN.                      DMN2219
        MOVE 6 TO IFPT.                                              DMN2220
    D31. ADD 1 TO IFPT.                                              DMN2221
        IF IFA (IFPT) NOT = '(' GO TO D31.                           DMN2222
        MOVE 1 TO BC.                                                DMN2223
    D32. ADD 1 TO IFPT.                                              DMN2224
        MOVE IFA (IFPT) TO A.                                        DMN2225
        IF A = '(' ADD 1 TO BC.                                      DMN2226
        IF A = ')' SUBTRACT 1 FROM BC.                               DMN2227
        IF BC NOT = 0 GO TO D32.                                     DMN2228
        MOVE 6 TO CNPT.                                              DMN2229
    DG. ADD 1 TO CNPT.                                               DMN2230
        ADD 1 TO IFPT.                                               DMN2231
        MOVE IFA (IFPT) TO CN (CNPT).                                DMN2232
        IF IFA (IFPT) NOT = '$' GO TO DG.                            DMN2233
        GO TO D4A.                                                   DMN2234
    IFRETURN. MOVE IFIF TO CNCN.                                     DMN2235
    D3X. EXIT.                                                       DMN2236
        NOTE FINISH IFCARD.                                          DMN2237
    DE-CARD SECTION.                                                 DMN2238
    D4. ALTER IFSWITCH TO PROCEED TO D50.                            DMN2239
        ALTER IFSWITCH2 TO PROCEED TO D421.                          DMN2240
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D4A. ALTER D45 TO PROCEED TO D46.                                    DMN2241
     MOVE SPACES TO REG9.                                            DMN2242
     MOVE 6 TO CNPT.                                                 DMN2243
D41. ADD 1 TO CNPT.                                                  DMN2244
     MOVE CN (CNPT) TO A.                                            DMN2245
     IF A = ' ' GO TO D41.                                           DMN2246
     IF A = '=' GO TO D42.                                           DMN2247
     IF A = '(' GO TO D411.                                          DMN2248
     IF R9 (1) NOT = ' ' GO TO IFSWITCH2.                            DMN2249
     PERFORM R9LEFT.                                                 DMN2250
     MOVE A TO R9 (9).                                               DMN2251
     GO TO D41.                                                      DMN2252
D411. ALTER D45 TO PROCEED TO D47.                                   DMN2253
D42. PERFORM R9LEFT-JUSTIFY.                                         DMN2254
     MOVE REG9 TO GER9.                                              DMN2255
     PERFORM DET-IF-DIFF.                                            DMN2256
     IF DID = 1 GO TO D48.                                           DMN2257
     MOVE SYMBOL-TABLE-CODE TO N.                                    DMN2258
     MOVE 1 TO PNU.                                                  DMN2259
D42111. PERFORM UNPACK.                                              DMN2260
     IF PNU1 = 1 GO TO D42112.                                       DMN2261
     MOVE TEMPORARY TO TABLE-AREA.                                   DMN2262
     IF TB3 NOT = 'X' GO TO D42111.                                  DMN2263
     IF TB1 NOT = GER9 GO TO D42111.                                 DMN2264
     GO TO IFSWITCH2.                                                DMN2265
D42112. MOVE SPACES TO TABLE-AREA.                                   DMN2266
     IF CN (CNPT) NOT = '(' GO TO D42113.                            DMN2267
     IF ALLD NOT = 1 GO TO D42113.                                   DMN2268
     MOVE 1 TO PNU.                                                  DMN2269
     MOVE DIM-CODE TO N.                                             DMN2270
D42151. PERFORM UNPACK.                                              DMN2271
     IF PNU1 = 1 GO TO D42152.                                       DMN2272
     MOVE TEMPORARY TO TABLE-AREA.                                   DMN2273
     IF GER9 NOT = TB1 GO TO D42151.                                 DMN2274
     GO TO D42114.                                                   DMN2275
D42152. MOVE SPACES TO OUT.                                          DMN2276
     MOVE 'NO DIMENSION CARD FOR    ' TO OUTCARD.                    DMN2277
     MOVE G9 (1) TO DC (23).                                         DMN2278
     MOVE G9 (2) TO DC (24).                                         DMN2279
     MOVE G9 (3) TO DC (25).                                         DMN2280
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           MOVE G9 (4) TO DC (26).                                  DMN2281
           MOVE G9 (5) TO DC (27).                                  DMN2282
           MOVE G9 (6) TO DC (28).                                  DMN2283
           MOVE G9 (7) TO DC (29).                                  DMN2284
           MOVE G9 (8) TO DC (30).                                  DMN2285
           MOVE G9 (9) TO DC (31).                                  DMN2286
           PERFORM WRITE-OUT.                                       DMN2287
       D42113. MOVE '$' TO TBL3S (1, 5).                            DMN2288
           MOVE GER9 TO TB1.                                        DMN2289
       D42114. MOVE 'X' TO TB3.                                     DMN2290
           MOVE 'X' TO TBTYPE.                                      DMN2291
           MOVE SYMBOL-TABLE-CODE TO N.                             DMN2292
           MOVE TABLE-AREA TO INTERMEDIATE.                         DMN2293
           PERFORM PUT-AWAY.                                        DMN2294
       IFSWITCH2. GO TO D421.                                       DMN2295
       D421. GO TO D4X.                                             DMN2296
       D48. MOVE SYMBOL-TABLE-CODE TO N.                            DMN2297
           MOVE 1 TO PNU.                                           DMN2298
       D462. PERFORM UNPACK.                                        DMN2299
           IF PNU1 = 1 GO TO D45.                                   DMN2300
           MOVE TEMPORARY TO TABLE-AREA.                            DMN2301
           IF REG9 = TB1 GO TO IFSWITCH.                            DMN2302
           GO TO D462.                                              DMN2303
       D45. GO TO D46.                                              DMN2304
       D46. MOVE '$' TO TBL3S (1, 5).                               DMN2305
           MOVE 00001 TO INCR.                                      DMN2306
       D477. PERFORM RECONSTRUCT-START.                             DMN2307
           MOVE SYMBOL-TABLE-CODE TO N.                             DMN2308
           MOVE 'F' TO TB3.                                         DMN2309
           MOVE 'B' TO TBTYPE.                                      DMN2310
       D461. PERFORM RECONSTRUCT-DIFF.                              DMN2311
           MOVE ARRAY-NM TO TB2.                                    DMN2312
           ADD INCR TO ARRAY-NM.                                    DMN2313
           IF RDS = 1 MOVE 'R' TO TB3.                              DMN2314
           MOVE TABLE-AREA TO INTERMEDIATE.                         DMN2315
           PERFORM PUT-AWAY.                                        DMN2316
           IF RDS = 0 GO TO D461.                                   DMN2317
           PERFORM RECONSTRUCT-DIFF.                                DMN2318
           MOVE 'S' TO TBTYPE.                                      DMN2319
           MOVE TABLE-AREA TO INTERMEDIATE.                         DMN2320
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           PERFORM PUT-AWAY.                                                    DMN2321
         IFSWITCH. GO TO D50.                                                   DMN2322
         D50. GO TO D4X.                                                        DMN2323
         D47. MOVE DIM-CODE TO N.                                               DMN2324
              MOVE 1 TO PNU.                                                    DMN2325
         D471. PERFORM UNPACK.                                                  DMN2326
              IF PNU1 = 1 GO TO DIM-ERA.                                        DMN2327
              MOVE TEMPORARY TO TABLE-AREA.                                     DMN2328
              IF REG9 NOT = TB1 GO TO D471.                                     DMN2329
         D474. MOVE 00001 TO INCR.                                              DMN2330
              MOVE 0 TO DPT2.                                                   DMN2331
         D475. ADD 1 TO DPT2.                                                   DMN2332
              MOVE TBL3 (DPT2) TO AL5.                                          DMN2333
              IF A5 (5) = '$' GO TO D477.                                       DMN2334
              PERFORM AL5-NM5.                                                  DMN2335
              COMPUTE INCR = INCR * NM5, ON SIZE ERROR GO TO DIM-ERA2.          DMN2336
              GO TO D475.                                                       DMN2337
         D4X. EXIT.                                                             DMN2338
              NOTE FINISH DE-CARD.                                              DMN2339
$CBEND                                                                          DMN2340
$IBSYS                                                                          DMN2341
$IBSYS                                                                          DMN2342
$IBMAP AMEDAT                                                                   DMN2343
       ENTRY   DATE                                                             DMN2344
DATE   SAVE    4,2                                                              DMN2345
       AXT     0,2                                                              DMN2346
       CAL     S.SDAT                                                           DMN2347
       LGR     30                                                               DMN2348
       TZE     *+3                                                              DMN2349
       ZAC                                                                      DMN2350
       AXT     1,2                                                              DMN2351
       LGL     6                                                                DMN2352
       XEC     OP,2                                                             DMN2353
       PAC     0,2                                                              DMN2354
       ZAC                                                                      DMN2355
       LGL     6                                                                DMN2356
       TNZ     *+2                                                              DMN2357
       ORA     =060                                                             DMN2358
       LGL     6                                                                DMN2359
       ALS     24                                                               DMN2360
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        TOV     *+1                                     DMN2361
        ORA     LIST-1,2                                DMN2362
        SLW*    3,4                                     DMN2363
        ZAC                                             DMN2364
        LGL     30                                      DMN2365
        ORA     =H 00                                   DMN2366
        SLW*    4,4                                     DMN2367
        RETURN  DATE                                    DMN2368
        ADD     =10                                     DMN2369
OP      NOP                                             DMN2370
        BCI     1,00 NIL                                DMN2371
LIST    BCI     1,00 JAN                                DMN2372
        BCI     1,00 FEB                                DMN2373
        BCI     1,00 MAR                                DMN2374
        BCI     1,00 APR                                DMN2375
        BCI     1,00 MAY                                DMN2376
        BCI     1,00 JUN                                DMN2377
        BCI     1,00 JUL                                DMN2378
        BCI     1,00 AUG                                DMN2379
        BCI     1,00 SEP                                DMN2380
        BCI     1,00 OCT                                DMN2381
        BCI     1,00 NOV                                DMN2382
        BCI     1,00 DEC                                DMN2383
        END                                             DMN2384
$IBMAP  DMNNMD                                          DMN2385
        ENTRY   DMNNWB                                  DMN2386
DMNNWB  TRA     *+1                                     DMN2387
        TSX     S.SLDR,4                                DMN2388
        MZE                                             DMN2389
        END                                             DMN2390
$ENTRY                                                  DMN2391
$IBSYS                                                  DMN2392
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$IBSYS                                                                  DMN2393
$ID         13084                                                       DMN2394
$JOB          0002 N.W.BENNETT                                          DMN2395
$TIME         90                                                        DMN2396
$*            PLEASE DIAL IN TAPE 4.                                    DMN2397
$IBJOB DMNAMB  COBOL,MAP,DECK,NOGO                                      DMN2398
$IBCBC DMNAMB  DECK,NOLIST                                              DMN2399
       IDENTIFICATION DIVISION.                                         DMN2400
           PROGRAM-ID. DEMON.                                           DMN2401
       ENVIRONMENT DIVISION.                                            DMN2402
       CONFIGURATION SECTION.                                           DMN2403
           SOURCE-COMPUTER. IBM-7040.                                   DMN2404
           OBJECT-COMPUTER. IBM-7040, MEMORY SIZE 32768 WORDS.          DMN2405
       INPUT-OUTPUT SECTION.                                            DMN2406
           FILE-CONTROL. SELECT INFILE, ASSIGN TO IN,                   DMN2407
                   SELECT BINFILE, ASSIGN TO U04, RESERVE NO            DMN2408
                   ALTERNATE AREA,                                      DMN2409
                   SELECT PUNCHFILE, ASSIGN TO PP,                      DMN2410
                   SELECT FORTFILE, ASSIGN TO U04, RESERVE NO ALTERNATE DMN2411
                   AREA,                                                DMN2412
                   SELECT OUTFILE, ASSIGN TO OU.                        DMN2413
       DATA DIVISION.                                                   DMN2414
       FILE SECTION.                                                    DMN2415
           FD INFILE, RECORD CONTAINS 84 CHARACTERS, DATA RECORD IS     DMN2416
           INP, LABEL RECORD IS OMITTED.                                DMN2417
           01 INP.                                                       DMN2418
            02 INCARD.                                                  DMN2419
             03 CD, SIZE IS 1 AN CHARACTER, OCCURS 80 TIMES.            DMN2420
            02 FILLER, SIZE IS 4 AN CHARACTERS.                         DMN2421
           FD BINFILE, RECORD CONTAINS 3000 CHARACTERS, DATA RECORD IS  DMN2422
           BINOUT, RECORDING MODE IS BINARY, LABEL RECORD IS OMITTED.   DMN2423
           01 BINOUT.                                                   DMN2424
            02 BINN, SIZE IS 4 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT, DMN2425
                   OCCURS 500 TIMES.                                    DMN2426
           FD PUNCHFILE, RECORD CONTAINS 84 CHARACTERS, DATA RECORD IS  DMN2427
           LUNCH, LABEL RECORD IS OMITTED.                              DMN2428
           01 LUNCH.                                                    DMN2429
            02 LUNCH-CARD, SIZE IS 80 AN CHARACTERS.                    DMN2430
            02 FILLER, SIZE IS 4 AN CHARACTERS.                         DMN2431
           FD FORTFILE, RECORD CONTAINS 90 CHARACTERS, DATA RECORD IS   DMN2432
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     FORT, LABEL RECORD IS OMITTED.                                          DMN2433
     01 FORT.                                                                DMN2434
      02 T3CW, SIZE IS 6 AN CHARACTERS.                                      DMN2435
      02 FORTCARD, SIZE IS 80 AN CHARACTERS.                                 DMN2436
       02 FILLER, SIZE IS 4 AN CHARACTERS.                                   DMN2437
     FD OUTFILE, RECORD CONTAINS 132 CHARACTERS, DATA RECORD IS              DMN2438
     OUT, LABEL RECORD IS OMITTED.                                           DMN2439
     01 OUT.                                                                 DMN2440
      02 FILLER, SIZE IS 2 AN CHARACTERS.                                    DMN2441
      02 OUTCARD.                                                            DMN2442
       03 DC, SIZE IS 1 AN CHARACTER, OCCURS 80 TIMES.                       DMN2443
      02 FILLER, SIZE IS 50 AN CHARACTERS.                                   DMN2444
WORKING-STORAGE SECTION.                                                     DMN2445
     01 BINPT, SIZE IS 6 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2446
     01 DATPT, SIZE IS 6 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2447
     01 DAT-DAT.                                                             DMN2448
      02 DAT, SIZE IS 4 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,            DMN2449
            OCCURS 2 TIMES.                                                  DMN2450
     01 ZORRO, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2451
     01 GSNU1, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.            DMN2452
     01 SAPT, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.            DMN2453
     01 ADR, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.             DMN2454
     01 ADRC, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.            DMN2455
     01 ADRD, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.            DMN2456
     01 NR5, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.             DMN2457
     01 TBPT,  SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2458
     01 TBPT2, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2459
     01 TMPT,  SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2460
     01 DPT2,  SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2461
     01 IFPT,  SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2462
     01 IFPT2, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2463
     01 FXD, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.              DMN2464
            88 FIXED-POINT, VALUE IS 1.                                      DMN2465
     01 DID, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.              DMN2466
     01 NM,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2467
     01 RNM,   SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2468
     01 RNM2,  SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2469
     01 RDS, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.              DMN2470
     01 CDPT,  SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2471
     01 CNPT,  SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.           DMN2472
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01 CNPT2, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2473
01 CNPT4, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2474
01 BC, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN2475
       SIGNED.                                                 DMN2476
01 EQ, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.      DMN2477
01 NO-GO, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN2478
01 EQBC, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.    DMN2479
01 EQCM, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.    DMN2480
01 NCPC, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.   DMN2481
01 NF,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.   DMN2482
01 NPC,  SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.   DMN2483
01 GNFFF, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2484
01 FMPTR, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2485
01 GNFU1, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN2486
01 TEMP-REG, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED      DMN2487
       RIGHT.                                                  DMN2488
01 PERM-REG, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED      DMN2489
       RIGHT.                                                  DMN2490
01 OP-COUNT, SIZE 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2491
01 DFIVE, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2492
01 DSC-FND, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED        DMN2493
       RIGHT.                                                  DMN2494
01 FNCDG, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN2495
       88 FNC, VALUE IS 1.                                     DMN2496
01 FDX, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.     DMN2497
01 BC2, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2498
01 CNPT3, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2499
01 DCPT,  SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2500
01 NT, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.      DMN2501
       88 NUMBER, VALUE IS 1.                                  DMN2502
       88 ALPHA, VALUE IS 2.                                   DMN2503
01 PHASEND, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED        DMN2504
       RIGHT.                                                  DMN2505
       88 END-OF-PHASE, VALUE IS 1.                            DMN2506
01 PNU,   SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN2507
01 PNU1,  SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT.   DMN2508
01 P1,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2509
01 P2,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2510
01 P3,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2511
01 P4,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2512
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01 P5,    SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2513
01 N, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.      DMN2514
01 POINTER.                                                    DMN2515
 02 PT,  SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,   DMN2516
       OCCURS 30 TIMES.                                        DMN2517
01 PERM1, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2518
01 PERM2, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2519
01 TEMP1, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2520
01 TEMP2, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.  DMN2521
01 DATAD, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED         DMN2522
       RIGHT, VALUE IS 0.                                      DMN2523
01 FILLY-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED        DMN2524
       RIGHT, VALUE IS 0.                                      DMN2525
01 CCC, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,     DMN2526
       VALUE IS 0.                                             DMN2527
01 SENM, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,   DMN2528
       VALUE IS 0.                                             DMN2529
01 LIST-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED         DMN2530
       RIGHT, VALUE IS 0.                                      DMN2531
01 DECK-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED         DMN2532
       RIGHT, VALUE IS 0.                                      DMN2533
01 TAPE-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED         DMN2534
       RIGHT, VALUE IS 1.                                      DMN2535
01 DUMP-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED         DMN2536
       RIGHT, VALUE IS 0.                                      DMN2537
01 FUNCTION-CARDS-CODE, SIZE IS 2 COMPUTATIONAL DIGIT,         DMN2538
       SYNCHRONIZED RIGHT, VALUE IS 01.                        DMN2539
01 DIM-CODE, SIZE IS 2 COMPUTATIONAL DIGIT,                    DMN2540
       SYNCHRONIZED RIGHT, VALUE IS 02.                        DMN2541
01 DO-TABLE-CODE, SIZE IS 2 COMPUTATIONAL DIGIT,               DMN2542
       SYNCHRONIZED RIGHT, VALUE IS 03.                        DMN2543
01 SYMBOL-TABLE-CODE, SIZE IS 2 COMPUTATIONAL DIGIT,           DMN2544
       SYNCHRONIZED RIGHT, VALUE IS 04.                        DMN2545
01 ALTER-CARD-CODE,     SIZE IS 2 COMPUTATIONAL DIGITS,        DMN2546
       SYNCHRONIZED RIGHT, VALUE IS 05.                        DMN2547
01 BIN-OUT-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED  DMN2548
       RIGHT, VALUE IS 06.                                     DMN2549
01 BASIC-LIST-CODE,     SIZE IS 2 COMPUTATIONAL DIGITS,        DMN2550
       SYNCHRONIZED RIGHT, VALUE IS 07.                        DMN2551
01 SUPP-LIST-CODE,      SIZE IS 2 COMPUTATIONAL DIGITS,        DMN2552
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           SYNCHRONIZED RIGHT, VALUE IS 08.                              DMN2553
    01 SUB-LIST-CODE, SIZE IS 2 COMPUTATIONAL DIGITS,                    DMN2554
           SYNCHRONIZED RIGHT, VALUE IS 09.                              DMN2555
    01 CONDITION-CODE,      SIZE IS 2 COMPUTATIONAL DIGITS,              DMN2556
           SYNCHRONIZED RIGHT, VALUE IS 10.                              DMN2557
    01 SUB-BC-CODE,         SIZE IS 2 COMPUTATIONAL DIGITS,              DMN2558
           SYNCHRONIZED RIGHT, VALUE IS 11.                              DMN2559
    01 BOUND-EQ-CODE,       SIZE IS 2 COMPUTATIONAL DIGITS,              DMN2560
           SYNCHRONIZED RIGHT, VALUE IS 12.                              DMN2561
    01 METHOD-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED         DMN2562
           RIGHT, VALUE IS 13.                                           DMN2563
    01 TOLERANCE-CODE, SIZE IS 2 COMPUTATIONAL DIGITS,                   DMN2564
           SYNCHRONIZED RIGHT, VALUE IS 14.                              DMN2565
    01 FREQ-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2566
           RIGHT, VALUE IS 15.                                           DMN2567
    01 USE-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED            DMN2568
           RIGHT, VALUE IS  6.                                           DMN2569
    01 BCD-OUT CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED        DMN2570
           RIGHT, VALUE IS 17.                                           DMN2571
    01 CGT1-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2572
           RIGHT, VALUE IS 18.                                           DMN2573
    01 CGT2-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2574
           RIGHT, VALUE IS 19.                                           DMN2575
    01 CGT3-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2576
           RIGHT, VALUE IS 20.                                           DMN2577
    01 CGT4-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2578
           RIGHT, VALUE IS 21.                                           DMN2579
    01 CGT5-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2580
           RIGHT, VALUE IS 22.                                           DMN2581
    01 CGT6-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2582
           RIGHT, VALUE IS 23.                                           DMN2583
    01 CGT7-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2584
           RIGHT, VALUE IS 24.                                           DMN2585
    01 ITERATE-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED        DMN2586
           RIGHT, VALUE IS 25.                                           DMN2587
    01 PRE-CARD-CODE, SIZE IS 2 COMPUTATIONAL DIGITS,                    DMN2588
           SYNCHRONIZED RIGHT, VALUE IS 26.                              DMN2589
    01 POST-CARD-CODE, SIZE IS 2 COMPUTATIONAL DIGITS,                   DMN2590
           SYNCHRONIZED RIGHT, VALUE IS 27.                              DMN2591
    01 REL-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED            DMN2592
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           RIGHT, VALUE IS 25.                                          DMN2593
    01 XACT-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED          DMN2594
           RIGHT, VALUE IS 29.                                          DMN2595
    01 LIN-CODE, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED           DMN2596
           RIGHT, VALUE IS 30.                                          DMN2597
    01 INTERP, PICTURE IS 9, VALUE IS 0.                                DMN2598
    01 X-FOUND, PICTURE IS 9, VALUE IS 0.                               DMN2599
    01 L-FOUND, PICTURE IS 9, VALUE IS 0.                               DMN2600
    01 ITE-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,        DMN2601
           VALUE IS 0.                                                  DMN2602
    01 TOL-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,        DMN2603
           VALUE IS 0.                                                  DMN2604
    01 UZED, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,        DMN2605
           VALUE IS 0.                                                  DMN2606
    01 AVAILABLE-SNM, SIZE IS 5 COMPUTATIONAL DIGITS,                   DMN2607
           SYNCHRONIZED RIGHT, VALUE IS 04400.                          DMN2608
    01 CHPL, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,        DMN2609
           VALUE IS 00132.                                              DMN2610
    01 BCC, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED                DMN2611
           RIGHT, VALUE IS 00000.                                       DMN2612
    01 BASD, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,        DMN2613
           VALUE IS 0.                                                  DMN2614
    01 SUPD, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,        DMN2615
           VALUE IS 0.                                                  DMN2616
    01 FRED, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,        DMN2617
           VALUE IS 0.                                                  DMN2618
    01 PAD, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,         DMN2619
           VALUE IS 0.                                                  DMN2620
    01 SHFT, SIZE IS 1 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,        DMN2621
           VALUE IS 0.                                                  DMN2622
    01 SUBNM, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED              DMN2623
           RIGHT, VALUE IS 00000.                                       DMN2624
    01 COND-NM, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED            DMN2625
           RIGHT, VALUE IS 00000.                                       DMN2626
    01 BC-NM, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,       DMN2627
           VALUE IS 00000.                                              DMN2628
    01 ARRAY-NM, SIZE IS 5 COMPUTATIONAL DIGITS,                        DMN2629
           SYNCHRONIZED RIGHT, VALUE IS 00002.                          DMN2630
    01 NOBD, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,         DMN2631
           VALUE IS 0.                                                  DMN2632
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01 ALLD, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,      DMN2633
       VALUE IS 0.                                               DMN2634
01 NOOD, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED RIGHT,      DMN2635
       VALUE IS 0.                                               DMN2636
01 PTE, SIZE IS 5 COMPUTATIONAL DIGITS,                          DMN2637
       SYNCHRONIZED RIGHT, VALUE IS 00000.                       DMN2638
01 STORE-SIZE, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED      DMN2639
       RIGHT, VALUE IS 15000.                                    DMN2640
01 NTER,  SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2641
01 NTER2, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2642
01 NEW-AREA, SIZE IS 960 AN CHARACTERS.                          DMN2643
01 PET.                                                          DMN2644
 02 PTS, PICTURE IS 9, OCCURS 5 TIMES.                           DMN2645
01 PTM,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2646
01 TRANSFER.                                                     DMN2647
 02 STA, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN2648
       OCCURS 30 TIMES.                                          DMN2649
01 SAT.                                                          DMN2650
 02 SATS, PICTURE IS 9, OCCURS 5 TIMES.                          DMN2651
01 OUT-POINTER.                                                  DMN2652
 02 STP, SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT,     DMN2653
       OCCURS 30 TIMES.                                          DMN2654
01 PTR,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2655
01 PRE,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2656
01 INCR,  SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2657
01 T,     SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2658
01 D5,    SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2659
01 NCT, SIZE IS 2 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.      DMN2660
01 NM5,   SIZE IS 5 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.    DMN2661
01 CAPT, SIZE IS 3 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.     DMN2662
01 CARD-AREA.                                                    DMN2663
 02 CA,  PICTURE IS X, OCCURS 960 TIMES.                         DMN2664
01 ROB1, SIZE IS 6 AN CHARACTERS, SYNCHRONIZED RIGHT.            DMN2665
01 ROB2, SIZE IS 6 AN CHARACTERS, SYNCHRONIZED RIGHT.            DMN2666
01 ROB3.                                                         DMN2667
 02 RBO, SIZE IS 1 AN CHARACTER, OCCURS 6 TIMES.                 DMN2668
01 DELAY-D, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED          DMN2669
       RIGHT, VALUE IS 0.                                        DMN2670
01 DELAY-D1, SIZE IS 1 COMPUTATIONAL DIGIT, SYNCHRONIZED         DMN2671
       RIGHT, VALUE IS 0.                                        DMN2672
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01 OUTCARD1.                                                    DMN2673
 02 DC1, SIZE IS 1 AN CHARACTER, OCCURS 80 TIMES.               DMN2674
01 OUTCARD2, SIZE IS 80 AN CHARACTERS.                          DMN2675
01 CALOOK.                                                      DMN2676
 02 CAL, PICTURE IS X, OCCURS 5 TIMES.                          DMN2677
01 DSN.                                                         DMN2678
 02 DS, PICTURE IS X, OCCURS 5 TIMES.                           DMN2679
01 AL5.                                                         DMN2680
 02 A5, PICTURE IS X, OCCURS 5 TIMES.                           DMN2681
01 SENMA.                                                       DMN2682
 02 SENMA1, PICTURE IS X, OCCURS 5 TIMES.                       DMN2683
01 DIDG, PICTURE IS X.                                          DMN2684
01 Z5.                                                          DMN2685
 02 Z1, PICTURE IS X.                                           DMN2686
 02 Z4, PICTURE IS XXXX.                                        DMN2687
01 MET-NAME, PICTURE IS XXXXXXXXX.                              DMN2688
01 PC, PICTURE IS X.                                            DMN2689
01 GSP, PICTURE IS X.                                           DMN2690
01 SASA.                                                        DMN2691
 02 SA, PICTURE IS X, OCCURS 72 TIMES.                          DMN2692
01 PP.                                                          DMN2693
 02 PP1, PICTURE IS X.                                          DMN2694
 02 PP2, PICTURE IS X.                                          DMN2695
 02 PP3, PICTURE IS X.                                          DMN2696
 02 PP4, PICTURE IS X.                                          DMN2697
 02 PP5, PICTURE IS X.                                          DMN2698
01 C, PICTURE IS X.                                             DMN2699
01 MTYPE, PICTURE IS X.                                         DMN2700
01 TEST, PICTURE IS XXXXXXXXX.                                  DMN2701
01 TEMPORARY.                                                   DMN2702
 02 TR,  PICTURE IS X, OCCURS 960 TIMES.                        DMN2703
01 INTERMEDIATE.                                                DMN2704
 02 TM,  PICTURE IS X, OCCURS 960 TIMES.                        DMN2705
01 STORAGE.                                                     DMN2706
 02 ST, PICTURE IS X, OCCURS 15000 TIMES.                       DMN2707
01 REG4.                                                        DMN2708
 02 R4, SIZE IS 1 AN CHARACTER, OCCURS 4 TIMES.                 DMN2709
01 B, PICTURE IS X.                                             DMN2710
01 REG3.                                                        DMN2711
 02 R3, SIZE IS 1 AN CHARACTER, OCCURS 3 TIMES.                 DMN2712
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01 A, SIZE IS 1 AN CHARACTER.                                    DMN2713
01 AL, SIZE IS 1 AN CHARACTER.                                   DMN2714
01 REG9.                                                         DMN2715
 02 R9, SIZE IS 1 AN CHARACTER, OCCURS 9 TIMES.                  DMN2716
01 GER9.                                                         DMN2717
 02 G9, SIZE IS 1 AN CHARACTER, OCCURS 9 TIMES.                  DMN2718
01 REG2.                                                         DMN2719
 02 R2, SIZE IS 1 AN CHARACTER, OCCURS 2 TIMES.                  DMN2720
01 IFIF.                                                         DMN2721
 02 IFA, PICTURE IS X, OCCURS 960 TIMES.                         DMN2722
01 DO-NUM.                                                       DMN2723
 02 OR-DO.                                                       DMN2724
  03 ORD, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.                DMN2725
 02 NEW-DO.                                                      DMN2726
  03 NED, PICTURE IS X, OCCURS 5 TIMES.                          DMN2727
 02 DLA, PICTURE IS X, VALUE IS '$'.                            DMN2728
01 CNCN.                                                        DMN2729
 02 CN,  PICTURE IS X, OCCURS 960 TIMES.                        DMN2730
01 TABLE-AREA.                                                  DMN2731
 02 TB1.                                                        DMN2732
  03 TBL1, SIZE IS 1 AN CHARACTER, OCCURS 9 TIMES.              DMN2733
 02 TB2.                                                        DMN2734
  03 TBL2, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.              DMN2735
 02 TB3, SIZE IS 1 AN CHARACTER.                                DMN2736
 02 TBTYPE, PICTURE IS X.                                       DMN2737
 02 TB4.                                                        DMN2738
  03 TBL3, OCCURS 10 TIMES.                                     DMN2739
   04 TBL3S, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.            DMN2740
01 TABLE-AREA-2.                                                DMN2741
 02 TZ1.                                                        DMN2742
  03 TZL1, SIZE IS 1 AN CHARACTER, OCCURS 9 TIMES.              DMN2743
 02 TZ2.                                                        DMN2744
  03 TZL2, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.              DMN2745
 02 TZ3, SIZE IS 1 AN CHARACTER.                                DMN2746
 02 TZTYPE, PICTURE IS X.                                       DMN2747
 02 TZ4.                                                        DMN2748
  03 TZL3, OCCURS 10 TIMES.                                     DMN2749
   04 TZL3S, SIZE IS 1 AN CHARACTER, OCCURS 5 TIMES.            DMN2750
01 METHOD1, PICTURE IS XXXXXXXXX.                               DMN2751
01 METHOD2, PICTURE IS XXXXXXXXX.                               DMN2752
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      01 MTYPE1, PICTURE IS X.                                          DMN2753
      01 MTYPE2, PICTURE IS X.                                          DMN2754
      01 INDEPENDENT-VAR.                                               DMN2755
       02 IND, PICTURE IS XXXXXXXXX, VALUE IS 'T        '.             DMN2756
       02 INDF, PICTURE IS XXXXXXXXXXXX, VALUE IS '00001IB    $'.       DMN2757
      01 FCONTROL, SIZE IS 48 AN CHARACTERS.                            DMN2758
      01 FREAD, SIZE IS 48 AN CHARACTERS.                               DMN2759
      01 FWRITE.                                                        DMN2760
       02 FWR, PICTURE IS X, OCCURS 48 TIMES.                           DMN2761
      01 ENDD, SIZE IS 4 COMPUTATIONAL DIGITS, SYNCHRONIZED RIGHT.      DMN2762
PROCEDURE DIVISION.                                                    DMN2763
MAIN-LINE SECTION.                                                     DMN2764
MMM2. OPEN INPUT BINFILE.                                              DMN2765
      MOVE 0 TO DATPT.                                                 DMN2766
MMM. READ BINFILE, AT END GO TO MMM1.                                  DMN2767
MMM1. MOVE 0 TO BINPT.                                                 DMN2768
MMMA. ADD 1 TO BINPT.                                                  DMN2769
      ADD 1 TO DATPT.                                                  DMN2770
      MOVE 1 TO ENDD.                                                  DMN2771
      MOVE 0 TO DAT (DATPT).                                           DMN2772
      IF ENDD = 0 GO TO MMMC.                                          DMN2773
      MOVE BINN (BINPT) TO DAT (DATPT).                                DMN2774
MMMB. IF BINPT LESS THAN 500 GO TO MMMA.                               DMN2775
      GO TO MMM.                                                       DMN2776
MMMC. CLOSE BINFILE.                                                   DMN2777
      OPEN INPUT INFILE, OUTPUT OUTFILE.                               DMN2778
      MOVE SPACES TO OUT.                                              DMN2779
      OPEN OUTPUT FORTFILE.                                            DMN2780
      OPEN OUTPUT PUNCHFILE.                                           DMN2781
      MOVE SPACES TO FORT.                                             DMN2782
      MOVE '000904' TO T3CW.                                           DMN2783
      MOVE '$*              DEMON PROG ON 4, RESTORE AT END  ' TO      DMN2784
           FORTCARD.                                                   DMN2785
      IF TAPE-D = 1 WRITE FORT.                                        DMN2786
      IF DUMP-D NOT = 1 GO TO DUMP-L.                                  DMN2787
      DISPLAY PTE.                                                     DMN2788
      MOVE 0 TO N.                                                     DMN2789
DUMP-A. ADD 1 TO N.                                                    DMN2790
      IF N GREATER THAN 30 GO TO DUMP-L.                               DMN2791
      MOVE 1 TO PNU.                                                   DMN2792
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DUMP-B. MOVE SPACES TO TEMPORARY.                                    DMN2793
    PERFORM UNPACK.                                                  DMN2794
    IF PNU1 = 1 GO TO DUMP-A.                                        DMN2795
    MOVE TEMPORARY TO OUTCARD.                                       DMN2796
    MOVE N TO REG2.                                                  DMN2797
    MOVE R2 (1) TO OC (79).                                          DMN2798
    MOVE R2 (2) TO OC (80).                                          DMN2799
    WRITE OUT.                                                       DMN2800
    GO TO DUMP-B.                                                    DMN2801
DUMP-L. MOVE ZERO TO ZORRO, NOTE NO-OP.                              DMN2802
    MOVE 1 TO PNU.                                                   DMN2803
    MOVE PRE-CARD-CODE TO N.                                         DMN2804
KKK9. PERFORM UNPACK.                                                DMN2805
    IF PNU1 = 1 GO TO KKK10.                                         DMN2806
    MOVE TEMPORARY TO CARD-AREA.                                     DMN2807
    IF CA (1) = ',' MOVE '$' TO CA (1).                              DMN2808
    PERFORM WIND-UP.                                                 DMN2809
    GO TO KKK9.                                                      DMN2810
KKK10. MOVE ZERO TO ZORRO, NOTE NO-OP.                               DMN2811
    MOVE '      DIMENSION OY(00000,00000)$                    ' TO   DMN2812
         CARD-AREA.                                                  DMN2813
    COMPUTE NR5 = PERM-REG + TEMP-REG + 7.                           DMN2814
    SUBTRACT 1 FROM ARRAY-NM.                                        DMN2815
    MOVE ARRAY-NM TO AL5.                                            DMN2816
    MOVE A5 (1) TO CA (20).                                          DMN2817
    MOVE A5 (2) TO CA (21).                                          DMN2818
    MOVE A5 (3) TO CA (22).                                          DMN2819
    MOVE A5 (4) TO CA (23).                                          DMN2820
    MOVE A5 (5) TO CA (24).                                          DMN2821
    MOVE NR5 TO AL5.                                                 DMN2822
    MOVE A5 (1) TO CA (26).                                          DMN2823
    MOVE A5 (2) TO CA (27).                                          DMN2824
    MOVE A5 (3) TO CA (28).                                          DMN2825
    MOVE A5 (4) TO CA (29).                                          DMN2826
    MOVE A5 (5) TO CA (30).                                          DMN2827
    PERFORM WIND-UP.                                                 DMN2828
    IF NR5 = 7 GO TO ABC49.                                          DMN2829
    MOVE '      DIMENSION NR(000)$' TO CARD-AREA.                    DMN2830
    COMPUTE NM5 = NR5 - 6.                                           DMN2831
    MOVE NM5 TO AL5.                                                 DMN2832
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      MOVE A5 (3) TO CA (20).                                          DMN2833
      MOVE A5 (4) TO CA (21).                                          DMN2834
      MOVE A5 (5) TO CA (22).                                          DMN2835
      PERFORM WIND-UP.                                                 DMN2836
  ABC49. MOVE ZERO TO ZORRO, NOTE NO-OP.                               DMN2837
      IF COND-NM = 0 GO TO ABC533.                                     DMN2838
      MOVE '      DIMENSION OD(00000),NC(00000)$                ' TO   DMN2839
           CARD-AREA.                                                  DMN2840
      MOVE COND-NM TO AL5.                                             DMN2841
      MOVE A5 (1) TO CA (20), CA (30).                                 DMN2842
      MOVE A5 (2) TO CA (21), CA (31).                                 DMN2843
      MOVE A5 (3) TO CA (22), CA (32).                                 DMN2844
      MOVE A5 (4) TO CA (23), CA (33).                                 DMN2845
      MOVE A5 (5) TO CA (24), CA (34).                                 DMN2846
      PERFORM WIND-UP.                                                 DMN2847
  ABC533. MOVE ZERO TO ZORRO, NOTE NO-OP.                              DMN2848
      IF CCC = 0 GO TO ABC2.                                           DMN2849
      MOVE '      DIMENSION NM(00000)$                          ' TO   DMN2850
           CARD-AREA.                                                  DMN2851
      MOVE COND-NM TO AL5.                                             DMN2852
      MOVE A5 (1) TO CA (20).                                          DMN2853
      MOVE A5 (2) TO CA (21).                                          DMN2854
      MOVE A5 (3) TO CA (22).                                          DMN2855
      MOVE A5 (4) TO CA (23).                                          DMN2856
      MOVE A5 (5) TO CA (24).                                          DMN2857
      PERFORM WIND-UP.                                                 DMN2858
  ABC2. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN2859
      IF BC-NM = 0 GO TO ABC1.                                         DMN2860
      MOVE '      DIMENSION OI(00000),ON(00000),SIDW(00000,00000)$     DMN2861
-'                  ' TO CARD-AREA.                                    DMN2862
      MOVE BC-NM TO AL5.                                               DMN2863
      MOVE A5 (1) TO CA (20), CA (30), CA (42).                        DMN2864
      MOVE A5 (2) TO CA (21), CA (31), CA (43).                        DMN2865
      MOVE A5 (3) TO CA (22), CA (32), CA (44).                        DMN2866
      MOVE A5 (4) TO CA (23), CA (33), CA (45).                        DMN2867
      MOVE A5 (5) TO CA (24), CA (34), CA (46).                        DMN2868
      COMPUTE NM5 = BC-NM + 1.                                         DMN2869
      MOVE NM5 TO AL5.                                                 DMN2870
      MOVE A5 (1) TO CA (48).                                          DMN2871
      MOVE A5 (2) TO CA (49).                                          DMN2872
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           MOVE A5 (3) TO CA (50).                                          DMN2873
           MOVE A5 (4) TO CA (51).                                          DMN2874
           MOVE A5 (5) TO CA (52).                                          DMN2875
           PERFORM WIND-UP.                                                 DMN2876
       ABC1. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN2877
           MOVE '       NDE = 00000$       ' TO CARD-AREA.                  DMN2878
           MOVE ARRAY-NM TO AL5.                                            DMN2879
           MOVE A5 (1) TO CA (13).                                          DMN2880
           MOVE A5 (2) TO CA (14).                                          DMN2881
           MOVE A5 (3) TO CA (15).                                          DMN2882
           MOVE A5 (4) TO CA (16).                                          DMN2883
           MOVE A5 (5) TO CA (17).                                          DMN2884
           PERFORM WIND-UP.                                                 DMN2885
           MOVE '       N1    = 1$          ' TO CARD-AREA.                DMN2886
           PERFORM WIND-UP.                                                 DMN2887
           MOVE '       NF1   = 2$          ' TO CARD-AREA.                DMN2888
           PERFORM WIND-UP.                                                 DMN2889
           MOVE '       N2    = 3$          ' TO CARD-AREA.                DMN2890
           PERFORM WIND-UP.                                                 DMN2891
           MOVE '       NF2   = 4$          ' TO CARD-AREA.                DMN2892
           PERFORM WIND-UP.                                                 DMN2893
           MOVE '       N2D   = 5$          ' TO CARD-AREA.                DMN2894
           PERFORM WIND-UP.                                                 DMN2895
           MOVE '       NF2D  = 6$          ' TO CARD-AREA.                DMN2896
           PERFORM WIND-UP.                                                 DMN2897
           MOVE '       NF1D  = 7$          ' TO CARD-AREA.                DMN2898
           PERFORM WIND-UP.                                                 DMN2899
           IF BC-NM = 0 GO TO ABC3.                                         DMN2900
           MOVE 0 TO CNPT4.                                                 DMN2901
           MOVE ALTER-CARD-CODE TO N.                                       DMN2902
           MOVE 1 TO PNU.                                                   DMN2903
       JS1. PERFORM UNPACK.                                                 DMN2904
           IF PNU1 = 1 GO TO ABC3.                                          DMN2905
           ADD 1 TO CNPT4.                                                  DMN2906
           MOVE '       OI(00000) = $       ' TO CARD-AREA.                DMN2907
           MOVE CNPT4 TO AL5.                                               DMN2908
           MOVE A5 (1) TO CA (10).                                          DMN2909
           MOVE A5 (2) TO CA (11).                                          DMN2910
           MOVE A5 (3) TO CA (12).                                          DMN2911
           MOVE A5 (4) TO CA (13).                                          DMN2912
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    MOVE A5 (5) TO CA (14).                                          DMN2913
    MOVE 18 TO CAPT.                                                 DMN2914
    MOVE 6 TO PTR.                                                   DMN2915
JS4. ADD 1 TO PTR.                                                   DMN2916
    IF TR (PTR) NOT = '(' GO TO JS4.                                 DMN2917
    MOVE 1 TO BC.                                                    DMN2918
JS2. ADD 1 TO PTR.                                                   DMN2919
    MOVE TR (PTR) TO A.                                              DMN2920
    IF A = '(' ADD 1 TO BC.                                          DMN2921
    IF A = ')' SUBTRACT 1 FROM BC.                                   DMN2922
    IF A = ')' AND BC = 0 GO TO JS3.                                 DMN2923
    ADD 1 TO CAPT.                                                   DMN2924
    MOVE A TO CA (CAPT).                                             DMN2925
    GO TO JS2.                                                       DMN2926
JS3. ADD 1 TO CAPT.                                                  DMN2927
    MOVE '$' TO CA (CAPT).                                           DMN2928
    PERFORM WIND-UP.                                                 DMN2929
    GO TO JS1.                                                       DMN2930
ABC3. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN2931
    IF BCC = 0 GO TO BDC001.                                         DMN2932
    MOVE FCONTROL TO CARD-AREA.                                      DMN2933
    MOVE '$' TO CA (50).                                             DMN2934
    PERFORM WIND-UP.                                                 DMN2935
BDC001. MOVE ZERO TO ZORRO, NOTE NO-OP.                              DMN2936
    IF BCC = 0 GO TO BDC002.                                         DMN2937
    MOVE '      NI=-1$              ' TO CARD-AREA.                  DMN2938
    PERFORM WIND-UP.                                                 DMN2939
    MOVE ' 4186 NH=0$               ' TO CARD-AREA.                  DMN2940
    PERFORM WIND-UP.                                                 DMN2941
    MOVE '      NI=NI+1$            ' TO CARD-AREA.                  DMN2942
    PERFORM WIND-UP.                                                 DMN2943
    MOVE '      DO 4180 NJ = 1,000$                          ' TO    DMN2944
         CARD-AREA.                                                  DMN2945
    COMPUTE NM5 = BCC + 1.                                           DMN2946
    MOVE NM5 TO AL5.                                                 DMN2947
    MOVE A5 (3) TO CA (22).                                          DMN2948
    MOVE A5 (4) TO CA (23).                                          DMN2949
    MOVE A5 (5) TO CA (24).                                          DMN2950
    PERFORM WIND-UP.                                                 DMN2951
BDC002. MOVE ZERO TO ZORRO, NOTE NO-OP.                              DMN2952
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      IF COND-NM = 0 GO TO CDDD.                                        DMN2953
      MOVE '      DO 4113 NV=1,000$ ' TO CARD-AREA.                     DMN2954
      MOVE COND-NM TO AL5.                                              DMN2955
      MOVE A5 (3) TO CA (20).                                           DMN2956
      MOVE A5 (4) TO CA (21).                                           DMN2957
      MOVE A5 (5) TO CA (22).                                           DMN2958
      PERFORM WIND-UP.                                                  DMN2959
      MOVE ' 4113 NC(NV)=1$          ' TO CARD-AREA.                    DMN2960
      PERFORM WIND-UP.                                                  DMN2961
  CDDD. MOVE ZERO TO ZORRO, NOTE NO-OP.                                 DMN2962
      IF NR5 = 7 GO TO ABC531.                                          DMN2963
      MOVE '      DO 00000 NK = 1,00000$                    ' TO        DMN2964
           CARD-AREA.                                                   DMN2965
      ADD 1 TO AVAILABLE-SNM.                                           DMN2966
      MOVE AVAILABLE-SNM TO AL5.                                        DMN2967
      MOVE A5 (1) TO CA (10).                                           DMN2968
      MOVE A5 (2) TO CA (11).                                           DMN2969
      MOVE A5 (3) TO CA (12).                                           DMN2970
      MOVE A5 (4) TO CA (13).                                           DMN2971
      MOVE A5 (5) TO CA (14).                                           DMN2972
      COMPUTE NM5 = NR5 - 6.                                            DMN2973
      MOVE NM5 TO AL5.                                                  DMN2974
      MOVE A5 (1) TO CA (23).                                           DMN2975
      MOVE A5 (2) TO CA (24).                                           DMN2976
      MOVE A5 (3) TO CA (25).                                           DMN2977
      MOVE A5 (4) TO CA (26).                                           DMN2978
      MOVE A5 (5) TO CA (27).                                           DMN2979
      PERFORM WIND-UP.                                                  DMN2980
      MOVE '      NR(NK) = NK+7$     ' TO CARD-AREA.                    DMN2981
      MOVE AVAILABLE-SNM TO DSN.                                        DMN2982
      PERFORM WIND-UP.                                                  DMN2983
 ABC531. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN2984
      IF CCC NOT = 1 GO TO CDDZ.                                        DMN2985
      MOVE 1 TO PNU.                                                    DMN2986
      MOVE CONDITION-CODE TO N.                                         DMN2987
      MOVE 0 TO CNPT4.                                                  DMN2988
 CDDZ1. PERFORM UNPACK.                                                 DMN2989
      IF PNU1 = 1 GO TO CDDZ.                                           DMN2990
      MOVE '      NM(000) = 1$       ' TO CARD-AREA.                    DMN2991
      ADD 1 TO CNPT4.                                                   DMN2992
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      MOVE CNPT4 TO AL5.                                          DMN2993
      MOVE A5 (3) TO CA (10).                                     DMN2994
      MOVE A5 (4) TO CA (11).                                     DMN2995
      MOVE A5 (5) TO CA (12).                                     DMN2996
      IF TR (8) = '0' GO TO CDDZ2.                                DMN2997
      MOVE 8 TO PTR.                                              DMN2998
      MOVE 16 TO CAPT.                                            DMN2999
      MOVE 0 TO BC.                                               DMN3000
  CDDZ3. ADD 1 TO PTR.                                            DMN3001
      MOVE TR (PTR) TO A.                                         DMN3002
      IF A = ',' AND BC = 0 GO TO CDDZ4.                          DMN3003
      IF A = '(' ADD 1 TO BC.                                     DMN3004
      IF A = ')' SUBTRACT 1 FROM BC.                              DMN3005
      GO TO CDDZ3.                                                DMN3006
  CDDZ4. ADD 1 TO PTR.                                            DMN3007
      MOVE TR (PTR) TO A.                                         DMN3008
      ADD 1 TO CAPT.                                              DMN3009
      MOVE A TO CA (CAPT).                                        DMN3010
      IF A NOT = '$' GO TO CDDZ4.                                 DMN3011
  CDDZ2. PERFORM WIND-UP.                                         DMN3012
      GO TO CDDZ1.                                                DMN3013
  CDDZ. MOVE ZERO TO ZORRO, NOTE NO-OP.                           DMN3014
      PERFORM INTAKE-INITIAL-VALUES.                              DMN3015
      IF BC-NM = 0 GO TO ABC4.                                    DMN3016
      MOVE 0 TO CNPT4.                                            DMN3017
      MOVE 1 TO PNU.                                              DMN3018
  JS5. MOVE ALTER-CARD-CODE TO N.                                 DMN3019
      PERFORM UNPACK.                                             DMN3020
      IF PNU1 = 1 GO TO ABC4.                                     DMN3021
      ADD 1 TO CNPT4.                                             DMN3022
      MOVE '                              ' TO CARD-AREA.         DMN3023
      MOVE 6 TO CAPT.                                             DMN3024
      MOVE 6 TO PTR.                                              DMN3025
  JS6. ADD 1 TO PTR.                                              DMN3026
      IF TR (PTR) NOT = '(' GO TO JS6.                            DMN3027
      MOVE 1 TO BC.                                               DMN3028
  JS7. ADD 1 TO PTR.                                              DMN3029
      MOVE TR (PTR) TO A.                                         DMN3030
      IF A = '(' ADD 1 TO BC.                                     DMN3031
      IF A = ')' SUBTRACT 1 FROM BC.                              DMN3032
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      IF A = ')' AND BC = 0 GO TO JS8.                                  DMN3033
      ADD 1 TO CAPT.                                                    DMN3034
      MOVE A TO CA (CAPT).                                              DMN3035
      GO TO JS7.                                                        DMN3036
 JS8. ADD 1 TO CAPT.                                                    DMN3037
      MOVE '=' TO CA (CAPT).                                            DMN3038
      ADD 1 TO CAPT.                                                    DMN3039
      MOVE '0' TO CA (CAPT).                                            DMN3040
      ADD 1 TO CAPT.                                                    DMN3041
      MOVE 'I' TO CA (CAPT).                                            DMN3042
      ADD 1 TO CAPT.                                                    DMN3043
      MOVE '(' TO CA (CAPT).                                            DMN3044
      ADD 1 TO CAPT.                                                    DMN3045
      MOVE CNPT4 TO AL5.                                                DMN3046
      MOVE A5 (1) TO CA (CAPT).                                         DMN3047
      ADD 1 TO CAPT.                                                    DMN3048
      MOVE A5 (2) TO CA (CAPT).                                         DMN3049
      ADD 1 TO CAPT.                                                    DMN3050
      MOVE A5 (3) TO CA (CAPT).                                         DMN3051
      ADD 1 TO CAPT.                                                    DMN3052
      MOVE A5 (4) TO CA (CAPT).                                         DMN3053
      ADD 1 TO CAPT.                                                    DMN3054
      MOVE A5 (5) TO CA (CAPT).                                         DMN3055
      ADD 1 TO CAPT.                                                    DMN3056
      MOVE ')' TO CA (CAPT).                                            DMN3057
      ADD 1 TO CAPT.                                                    DMN3058
      MOVE '$' TO CA (CAPT).                                            DMN3059
      MOVE CARD-AREA TO TEMPORARY.                                      DMN3060
      PERFORM TRANSLATE-CARD.                                           DMN3061
      GO TO JS5.                                                        DMN3062
 ABC4. MOVE ZERO TO ZORRO, NOTE NO-OP.                                  DMN3063
      IF BCC = 0 GO TO BAR5.                                            DMN3064
      MOVE '      IF(NJ-1) 4230,4230,4232$                  ' TO        DMN3065
           CARD-AREA.                                                   DMN3066
      PERFORM WIND-UP.                                                  DMN3067
      MOVE ' 4230 CONTINUE$          ' TO CARD-AREA.                    DMN3068
      PERFORM WIND-UP.                                                  DMN3069
      MOVE SPACES TO INTERMEDIATE.                                      DMN3070
      MOVE ALTER-CARD-CODE TO N.                                        DMN3071
      MOVE 0 TO PTM.                                                    DMN3072
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    MOVE 1 TO PNU.                                                    DMN3073
BRA1. PERFORM UNPACK.                                                 DMN3074
    IF PNU1 = 1 GO TO BRA2.                                           DMN3075
    IF PTM NOT = 0 MOVE ',' TO TM (PTM).                              DMN3076
    MOVE 0 TO BC.                                                     DMN3077
    MOVE 6 TO PTR.                                                    DMN3078
BRA3. ADD 1 TO PTR.                                                   DMN3079
    IF TR (PTR) NOT = '(' GO TO BRA3.                                 DMN3080
BRA4. ADD 1 TO PTR.                                                   DMN3081
    ADD 1 TO PTM.                                                     DMN3082
    MOVE TR (PTR) TO A.                                               DMN3083
    IF A = ')' AND BC = 0 GO TO BRA1.                                 DMN3084
    IF A = '(' ADD 1 TO BC.                                           DMN3085
    IF A = ')' SUBTRACT 1 FROM BC.                                    DMN3086
    MOVE A TO TM (PTM).                                               DMN3087
    GO TO BRA4.                                                       DMN3088
BRA2. MOVE '$' TO TM (PTM).                                           DMN3089
    MOVE 0 TO GSNU1.                                                  DMN3090
    MOVE 0 TO ADR.                                                    DMN3091
    ALTER GS TO PROCEED TO GSL.                                       DMN3092
    MOVE 0 TO PTM.                                                    DMN3093
    PERFORM GET-SYMBOL.                                               DMN3094
BAR1. MOVE 1 TO PNU.                                                  DMN3095
    MOVE BCD-OUT-CODE TO N.                                           DMN3096
    PERFORM UNPACK.                                                   DMN3097
    ADD 1 TO AVAILABLE-SNM.                                           DMN3098
    MOVE AVAILABLE-SNM TO DSN.                                        DMN3099
    MOVE DSN TO AL5.                                                  DMN3100
    MOVE SPACES TO CNCN.                                              DMN3101
    PERFORM MVOUSTM.                                                  DMN3102
    MOVE 'N' TO CN (31).                                              DMN3103
    MOVE 'I' TO CN (32).                                              DMN3104
    MOVE ',' TO CN (33).                                              DMN3105
    MOVE 33 TO CNPT.                                                  DMN3106
    MOVE '      FORMAT(1P3X14HINITIAL VALUE I4,                ' TO   DMN3107
        CARD-AREA.                                                    DMN3108
    MOVE 37 TO CAPT.                                                  DMN3109
    MOVE 21 TO FMPTR.                                                 DMN3110
    PERFORM GENERATE-FORMAT.                                          DMN3111
    PERFORM WIND-UP.                                                  DMN3112
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     MOVE CNCN TO TEMPORARY.                                          DMN3113
     PERFORM TRANSLATE-CARD.                                          DMN3114
BAR2. MOVE BCD-OUT-CODE TO N.                                         DMN3115
     PERFORM UNPACK.                                                  DMN3116
     IF PNU1 = 1  GO TO BAR3.                                         DMN3117
     MOVE CARD-AREA TO CNCN.                                          DMN3118
     MOVE 0 TO D5.                                                    DMN3119
BAR4. ADD 1 TO D5.                                                    DMN3120
     MOVE ' ' TO CN (D5).                                             DMN3121
     IF D5 LESS THAN 29 GO TO BAR4.                                   DMN3122
     MOVE AVAILABLE-SNM TO AL5.                                       DMN3123
     PERFORM MVOUSTM.                                                 DMN3124
     MOVE CNCN TO CARD-AREA.                                          DMN3125
     PERFORM WIND-UP.                                                 DMN3126
     GO TO BAR2.                                                      DMN3127
BAR3. IF GNFU1 = 0 PERFORM OUST-ALL.                                  DMN3128
     MOVE ' 4232 CONTINUE$          ' TO CARD-AREA.                   DMN3129
     PERFORM WIND-UP.                                                 DMN3130
BAR5. MOVE ZERO TO ZORRO, NOTE NO-OP.                                 DMN3131
     IF BCC = 0 GO TO JUDY.                                           DMN3132
     MOVE CGT1-CODE TO N.                                             DMN3133
     MOVE 1 TO PNU.                                                   DMN3134
     PERFORM UNPACK.                                                  DMN3135
     MOVE TEMPORARY TO INTERMEDIATE.                                  DMN3136
     MOVE 'NJ        ' TO REG9.                                       DMN3137
     PERFORM GENERATE-CGT.                                            DMN3138
     MOVE 1 TO PNU.                                                   DMN3139
     MOVE ALTER-CARD-CODE TO N.                                       DMN3140
     PERFORM UNPACK.                                                  DMN3141
     MOVE 5 TO NTER.                                                  DMN3142
     GO TO AT11.                                                      DMN3143
AT3. MOVE '      GO TO 4124$        ' TO CARD-AREA.                   DMN3144
     PERFORM WIND-UP.                                                 DMN3145
AT11. MOVE 0 TO NTER2.                                                DMN3146
AT1. ADD 1 TO NTER.                                                   DMN3147
     ADD 1 TO NTER2.                                                  DMN3148
     MOVE TM (NTER) TO DS (NTER2).                                    DMN3149
     IF NTER2 LESS THAN 5 GO TO AT1.                                  DMN3150
     MOVE 0 TO BC.                                                    DMN3151
      MOVE 0 TO CNPT.                                                 DMN3152
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AT4. ADD 1 TO CNPT.                                                    DMN3153
     MOVE TR (CNPT) TO A.                                              DMN3154
     IF A = '(' ADD 1 TO BC.                                           DMN3155
     IF A = ')' SUBTRACT 1 FROM BC.                                    DMN3156
     IF A = ',' AND BC = 0 GO TO AT5.                                  DMN3157
     IF A = '$' GO TO UNUSUAL-END.                                     DMN3158
     GO TO AT4.                                                        DMN3159
AT5. MOVE '      ODEL=                ' TO CARD-AREA.                  DMN3160
     MOVE 11 TO CAPT.                                                  DMN3161
AT6. ADD 1 TO CAPT.                                                    DMN3162
     ADD 1 TO CNPT.                                                    DMN3163
     MOVE TR (CNPT) TO CA (CAPT).                                      DMN3164
     IF TR (CNPT) NOT = '$' GO TO AT6.                                 DMN3165
     MOVE TEMPORARY TO NEW-AREA.                                       DMN3166
     MOVE CARD-AREA TO TEMPORARY.                                      DMN3167
     PERFORM TRANSLATE-CARD.                                           DMN3168
     MOVE NEW-AREA TO TEMPORARY.                                       DMN3169
     MOVE '                              =                             DMN3170
-'+ ODEL$          ' TO CARD-AREA.                                     DMN3171
     MOVE 0 TO CNPT.                                                   DMN3172
     MOVE 0 TO BC.                                                     DMN3173
     MOVE 6 TO CAPT.                                                   DMN3174
     MOVE 31 TO CNPT2.                                                 DMN3175
AT8. ADD 1 TO CNPT.                                                    DMN3176
     MOVE TR (CNPT) TO A.                                              DMN3177
     IF A = '$' GO TO UNUSUAL-END.                                     DMN3178
     IF A NOT = '(' GO TO AT8.                                         DMN3179
AT9. ADD 1 TO CNPT.                                                    DMN3180
     MOVE TR (CNPT) TO A.                                              DMN3181
     IF A = ')' AND BC = 0 GO TO AT10.                                 DMN3182
     IF A = '(' ADD 1 TO BC.                                           DMN3183
     IF A = ')' SUBTRACT 1 FROM BC.                                    DMN3184
     ADD 1 TO CNPT2.                                                   DMN3185
     MOVE A TO CA (CNPT2).                                             DMN3186
     ADD 1 TO CAPT.                                                    DMN3187
     MOVE A TO CA (CAPT).                                              DMN3188
     GO TO AT9.                                                        DMN3189
AT10. MOVE CARD-AREA TO TEMPORARY.                                     DMN3190
     PERFORM TRANSLATE-CARD.                                           DMN3191
     MOVE ALTER-CARD-CODE TO N.                                        DMN3192
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      PERFORM UNPACK.                                                    DMN3193
      IF PNU1 NOT = 1 GO TO AT3.                                         DMN3194
      MOVE ' 4124 CONTINUE$          ' TO CARD-AREA.                     DMN3195
      PERFORM WIND-UP.                                                   DMN3196
  JUDY. MOVE ZERO TO ZORRO, NOTE NO-OP.                                  DMN3197
      IF FRED = 0 GO TO ABC603.                                          DMN3198
      IF FOX = 1 GO TO ABC602.                                           DMN3199
      MOVE '      NQ = 0$            ' TO CARD-AREA.                     DMN3200
      PERFORM WIND-UP.                                                   DMN3201
      GO TO ABC603.                                                      DMN3202
  ABC602. MOVE '      OFR = 0.0$         ' TO CARD-AREA.                 DMN3203
      PERFORM WIND-UP.                                                   DMN3204
  ABC603. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN3205
      MOVE '      NB = 2$            ' TO CARD-AREA.                     DMN3206
      PERFORM WIND-UP.                                                   DMN3207
      MOVE '      NV = 0$            ' TO CARD-AREA.                     DMN3208
      PERFORM WIND-UP.                                                   DMN3209
      MOVE 0 TO IFPT.                                                    DMN3210
      MOVE 0 TO NF.                                                      DMN3211
      MOVE 0 TO NPC.                                                     DMN3212
      MOVE 0 TO NCPC.                                                    DMN3213
      IF MTYPE = 'R' GO TO MEG.                                          DMN3214
      MOVE 'P' TO MTYPE1.                                                DMN3215
      MOVE METHOD2 TO REG9.                                              DMN3216
      PERFORM OUT-METHOD.                                                DMN3217
      MOVE ' 4200 CONTINUE$          ' TO CARD-AREA.                     DMN3218
      PERFORM WIND-UP.                                                   DMN3219
  MEG. MOVE 'R' TO MTYPE1.                                               DMN3220
      MOVE METHOD1 TO REG9.                                              DMN3221
      PERFORM OUT-METHOD.                                                DMN3222
      PERFORM TABLES-TO-FUNCTION-CARDS.                                  DMN3223
      MOVE 1 TO PNU.                                                     DMN3224
      MOVE LIN-CODE TO N.                                                DMN3225
      PERFORM UNPACK.                                                    DMN3226
      IF PNU1 = 1 GO TO RICH1.                                           DMN3227
      MOVE '      OZONE=             ' TO CARD-AREA.                     DMN3228
      MOVE 12 TO CAPT.                                                   DMN3229
      MOVE 0 TO PTP.                                                     DMN3230
  RICH2. ADD 1 TO PTR.                                                   DMN3231
      MOVE TR (PTR) TO A.                                                DMN3232
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      ADD 1 TO CAPT.                                                    DMN3233
      MOVE A TO CA (CAPT).                                              DMN3234
      IF A NOT = '$' GO TO RICH2.                                       DMN3235
      PERFORM TRAN-NF2.                                                 DMN3236
      MOVE '       DO 4007 NK=1,NDE$ ' TO CARD-AREA.                    DMN3237
      PERFORM WIND-UP.                                                  DMN3238
      MOVE ' 4007 OY(NK,NF2)=OY(NK,NF2)/OZONE$                ' TO     DMN3239
           CARD-AREA.                                                   DMN3240
      PERFORM WIND-UP.                                                  DMN3241
RICH1. MOVE ZERO TO ZORRO, NOTE NO-OP.                                  DMN3242
      IF X-FOUND = 0 GO TO RICH3.                                       DMN3243
      MOVE '       IF(NV)4003,4003,4004$                      ' TO     DMN3244
           CARD-AREA.                                                   DMN3245
      PERFORM WIND-UP.                                                  DMN3246
      MOVE '04004' TO DSN.                                              DMN3247
      MOVE 1 TO PNU.                                                    DMN3248
      MOVE 0 TO PTM.                                                    DMN3249
      MOVE XACT-CODE TO N.                                              DMN3250
RICH4. PERFORM UNPACK.                                                  DMN3251
      IF PNU1 = 1 GO TO RICH51.                                         DMN3252
      IF TR (1) = '$' GO TO RICH6.                                      DMN3253
      ADD 1 TO AVAILABLE-SNM.                                           DMN3254
      MOVE AVAILABLE-SNM TO AL5.                                        DMN3255
RICH7. ADD 1 TO PTM.                                                    DMN3256
      MOVE A5 (1) TO TM (PTM).                                          DMN3257
      ADD 1 TO PTM.                                                     DMN3258
      MOVE A5 (2) TO TM (PTM).                                          DMN3259
      ADD 1 TO PTM.                                                     DMN3260
      MOVE A5 (3) TO TM (PTM).                                          DMN3261
      ADD 1 TO PTM.                                                     DMN3262
      MOVE A5 (4) TO TM (PTM).                                          DMN3263
      ADD 1 TO PTM.                                                     DMN3264
      MOVE A5 (5) TO TM (PTM).                                          DMN3265
      GO TO RICH4.                                                      DMN3266
RICH6. MOVE '04003' TO AL5.                                             DMN3267
      GO TO RICH7.                                                      DMN3268
RICH51. ADD 1 TO PTM.                                                   DMN3269
      MOVE '$' TO TM (PTM).                                             DMN3270
      MOVE 'NV       ' TO REG9.                                         DMN3271
      PERFORM GENERATE-CGT.                                             DMN3272
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RICH5. MOVE 0 TO PTM.                                                    DMN3273
    MOVE 1 TO PNU.                                                       DMN3274
RICH8. MOVE XACT-CODE TO N.                                              DMN3275
    PERFORM UNPACK.                                                      DMN3276
    IF PNU1 = 1 GO TO RICH9.                                             DMN3277
    IF TR (1) NOT = '$' GO TO RICH81.                                    DMN3278
    ADD 5 TO PTM.                                                        DMN3279
    GO TO RICH8.                                                         DMN3280
RICH81. ADD 1 TO PTM.                                                    DMN3281
    MOVE TM (PTM) TO DS (1).                                             DMN3282
    ADD 1 TO PTM.                                                        DMN3283
    MOVE TM (PTM) TO DS (2).                                             DMN3284
    ADD 1 TO PTM.                                                        DMN3285
    MOVE TM (PTM) TO DS (3).                                             DMN3286
    ADD 1 TO PTM.                                                        DMN3287
    MOVE TM (PTM) TO DS (4).                                             DMN3288
    ADD 1 TO PTM.                                                        DMN3289
    MOVE TM (PTM) TO DS (5).                                             DMN3290
    MOVE '      OZONE=              ' TO CARD-AREA.                      DMN3291
    MOVE 13 TO CAPT.                                                     DMN3292
    MOVE 0 TO PTR.                                                       DMN3293
RICH82. ADD 1 TO PTR.                                                    DMN3294
    MOVE TR (PTR) TO A.                                                  DMN3295
    ADD 1 TO CAPT.                                                       DMN3296
    MOVE A TO CA (CAPT).                                                 DMN3297
    IF A NOT = '$' GO TO RICH82.                                         DMN3298
    PERFORM TRAN-NF2.                                                    DMN3299
    MOVE '      GO TO 4005$         ' TO CARD-AREA.                      DMN3300
    PERFORM WIND-UP.                                                     DMN3301
    GO TO RICH8.                                                         DMN3302
RICH9. MOVE ' 4005 DO 4006 NK=1,NDE$ ' TO CARD-AREA.                     DMN3303
    PERFORM WIND-UP.                                                     DMN3304
    MOVE ' 4006 OY(NK,NF2)=OY(NK,NF2)/OZONE$              ' TO           DMN3305
          CARD-AREA.                                                     DMN3306
    PERFORM WIND-UP.                                                     DMN3307
    MOVE ' 4003 CONTINUE$           ' TO CARD-AREA.                      DMN3308
    PERFORM WIND-UP.                                                     DMN3309
RICH3. MOVE ZERO TO ZORRO, NOTE NO-OP.                                   DMN3310
    MOVE 1 TO PNU.                                                       DMN3311
    MOVE CGT6-CODE TO N.                                                 DMN3312
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      PERFORM UNPACK.                                                  DMN3313
      MOVE TEMPORARY TO INTERMEDIATE.                                  DMN3314
      MOVE 'NF       ' TO REG9.                                        DMN3315
      PERFORM GENERATE-CGT.                                            DMN3316
      MOVE CGT3-CODE TO N.                                             DMN3317
      MOVE 1 TO PNU.                                                   DMN3318
      PERFORM UNPACK.                                                  DMN3319
      MOVE TEMPORARY TO INTERMEDIATE.                                  DMN3320
      MOVE 'NV       ' TO REG9.                                        DMN3321
      MOVE '04175' TO DSN.                                             DMN3322
      PERFORM GENERATE-CGT.                                            DMN3323
      MOVE 0 TO PTM.                                                   DMN3324
      MOVE 1 TO PNU.                                                   DMN3325
  COUT. MOVE CONDITION-CODE TO N.                                      DMN3326
      PERFORM UNPACK.                                                  DMN3327
      IF PNU1 = 1 GO TO COUT1.                                         DMN3328
      ADD 1 TO AVAILABLE-SNM.                                          DMN3329
      MOVE AVAILABLE-SNM TO DSN.                                       DMN3330
      MOVE '      FORMAT(000H     ( ' TO CARD-AREA.                    DMN3331
      IF TR (1) NOT = 'B' GO TO COUT2.                                 DMN3332
      MOVE 'A' TO CA (20).                                             DMN3333
      MOVE 'T' TO CA (21).                                             DMN3334
      GO TO COUT3.                                                     DMN3335
  COUT2. IF TR (2) = 'N' GO TO COUT2A.                                 DMN3336
      MOVE 'E' TO CA (20).                                             DMN3337
      MOVE 'S' TO CA (21).                                             DMN3338
      GO TO COUT3.                                                     DMN3339
  COUT2A. MOVE 'N' TO CA (20).                                         DMN3340
      MOVE 'E' TO CA (21).                                             DMN3341
  COUT3. MOVE 23 TO CAPT.                                              DMN3342
      MOVE 8 TO PTR.                                                   DMN3343
  COUT4. ADD 1 TO PTR.                                                 DMN3344
      MOVE TR (PTR) TO A.                                              DMN3345
      ADD 1 TO CAPT.                                                   DMN3346
      IF A = '$' GO TO COUT41.                                         DMN3347
      MOVE A TO CA (CAPT).                                             DMN3348
      GO TO COUT4.                                                     DMN3349
  COUT41. MOVE ')' TO CA (CAPT).                                       DMN3350
      IF TR (1) = 'B' GO TO COUT5.                                     DMN3351
      MOVE CAPT TO CNPT4.                                              DMN3352
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           ADD 1 TO CAPT.                                          DMN3353
           MOVE ' ' TO CA (CAPT).                                  DMN3354
           MOVE 2 TO PTR.                                          DMN3355
           MOVE 0 TO D5.                                           DMN3356
       COUT42. ADD 1 TO PTR.                                       DMN3357
           ADD 1 TO CAPT.                                          DMN3358
           ADD 1 TO D5.                                            DMN3359
           MOVE TR (PTR) TO A5 (D5).                               DMN3360
           MOVE TR (PTR) TO CA (CAPT).                             DMN3361
           IF D5 LESS THAN 5 GO TO COUT42.                         DMN3362
           IF AL5 = '00000' MOVE CNPT4 TO CAPT.                    DMN3363
       COUT5. ADD 1 TO CAPT.                                       DMN3364
           MOVE ')' TO CA (CAPT).                                  DMN3365
           ADD 1 TO CAPT.                                          DMN3366
           MOVE '$' TO CA (CAPT).                                  DMN3367
           COMPUTE NM5 = CAPT - 19.                                DMN3368
           MOVE NM5 TO AL5.                                        DMN3369
           MOVE A5 (3) TO CA (14).                                 DMN3370
           MOVE A5 (4) TO CA (15).                                 DMN3371
           MOVE A5 (5) TO CA (16).                                 DMN3372
           PERFORM WIND-UP.                                        DMN3373
           ADD 1 TO PTM.                                           DMN3374
           MOVE TM (PTM) TO DS (1).                                DMN3375
           ADD 1 TO PTM.                                           DMN3376
           MOVE TM (PTM) TO DS (2).                                DMN3377
           ADD 1 TO PTM.                                           DMN3378
           MOVE TM (PTM) TO DS (3).                                DMN3379
           ADD 1 TO PTM.                                           DMN3380
           MOVE TM (PTM) TO DS (4).                                DMN3381
           ADD 1 TO PTM.                                           DMN3382
           MOVE TM (PTM) TO DS (5).                                DMN3383
           MOVE 1 TO PNU.                                          DMN3384
       COUT6. MOVE BCD-OUT-CODE TO N.                              DMN3385
           PERFORM UNPACK.                                         DMN3386
           IF PNU1 = 1 GO TO COUT7.                                DMN3387
           MOVE 0 TO PTR.                                          DMN3388
           MOVE 0 TO CAPT.                                         DMN3389
           MOVE AVAILABLE-SNM TO AL5.                              DMN3390
       COUT61. ADD 1 TO PTR.                                       DMN3391
           MOVE TR (PTR) TO A.                                     DMN3392
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           IF A = '*' GO TO COUT62.                                          DMN3393
           ADD 1 TO CAPT.                                                    DMN3394
           MOVE A TO CA (CAPT .                                              DMN3395
           IF A = '$' GO TO COUT63.                                          DMN3396
           GO TO COUT61.                                                     DMN3397
       COUT62. MOVE 0 TO D5.                                                 DMN3398
       COUT621. ADD 1 TO D5.                                                 DMN3399
           ADD 1 TO CAPT.                                                    DMN3400
           MOVE A5 (D5) TO CA (CAPT).                                        DMN3401
           IF D5 LESS THAN 5 GO TO COUT621.                                  DMN3402
           GO TO COUT61.                                                     DMN3403
       COUT63. SUBTRACT 1 FROM CAPT.                                         DMN3404
           MOVE CA (CAPT) TO A.                                              DMN3405
           IF A = ' ' GO TO COUT63.                                          DMN3406
           IF A = ',' MOVE '$' TO CA (CAPT).                                 DMN3407
           PERFORM WIND-UP.                                                  DMN3408
           GO TO COUT6.                                                      DMN3409
        OUT7. MOVE        GO TO 4171$        ' TO CARD-AREA.                DMN3410
            ERFORM WIND-UP.                                                  DMN3411
           GO TO COUT.                                                       DMN3412
       COUT1. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN3413
           MOVE '04172' TO DSN.                                              DMN3414
           MOVE 1 TO PNO.                                                    DMN3415
       BIN2. MOVE BIN-OUT-CODE TO N.                                         DMN3416
           PERFORM UNPACK.                                                   DMN3417
           MOVE TEMPORARY TO ONON.                                           DMN3418
           IF PNO1 = 1 GO TO BIN1.                                           DMN3419
           MOVE '                                (OY(NK,N2) OY(NK,NF2),NK=1, DMN3420
      -'NUE)$              ' TO CARD-AREA.                                   DMN3421
           MOVE 55 TO CAPT.                                                  DMN3422
       BIN2AA. ADD 1 TO CAPT.                                                DMN3423
           IF CA (CAPT) NOT = '$' GO TO BIN2AA.                              DMN3424
           MOVE 1 TO PNO.                                                    DMN3425
       BIN2AB. MOVE SYMBOL-TABLE-CODE TO N.                                  DMN3426
           PERFORM UNPACK.                                                   DMN3427
           IF PNO1 = 1 GO TO BIN2AC.                                         DMN3428
           MOVE TEMPORARY TO TABLE-AREA.                                     DMN3429
           IF TBTYPE NOT = 'X' GO TO BIN2AB.                                 DMN3430
           MOVE ',' TO CA (CAPT).                                            DMN3431
           MOVE 0 TO PTM.                                                    DMN3432
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BIN2AD. ADD 1 TO PTM.                                                  DMN3433
    ADD 1 TO CAPT.                                                     DMN3434
    IF PTM = 10 GO TO BIN2AB.                                          DMN3435
    MOVE TBL1 (PTM) TO CA (CAPT).                                      DMN3436
    GO TO BIN2AD.                                                      DMN3437
BIN2AC. MOVE '$' TO CA (CAPT).                                         DMN3438
    MOVE CNCN TO TEMPORARY.                                            DMN3439
    MOVE 0 TO CAPT.                                                    DMN3440
    MOVE 0 TO PTR.                                                     DMN3441
BIN3. ADD 1 TO PTR.                                                    DMN3442
    MOVE TR (PTR) TO A.                                                DMN3443
    IF A = '$' GO TO BIN4.                                             DMN3444
    ADD 1 TO CAPT.                                                     DMN3445
    MOVE A TO CA (CAPT).                                               DMN3446
    GO TO BIN3.                                                        DMN3447
BIN4. PERFORM WIND-UP.                                                 DMN3448
    GO TO BIN2.                                                        DMN3449
BIN1. IF DSN = '00000' GO TO BIN5.                                     DMN3450
    MOVE '      CONTINUE$          ' TO CARD-AREA.                     DMN3451
    PERFORM WIND-UP.                                                   DMN3452
BIN5. MOVE ZERO TO ZORRO, NOTE NO-OP.                                  DMN3453
    MOVE ' 4171 CONTINUE$          ' TO CARD-AREA.                     DMN3454
    PERFORM WIND-UP.                                                   DMN3455
    IF NOBD = 1 GO TO ABC707.                                          DMN3456
    MOVE BASIC-LIST-CODE TO N.                                         DMN3457
    PERFORM OUTPUT-STATEMENTS.                                         DMN3458
ABC707. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN3459
    IF ALLD NOT = 1 AND SUPD NOT = 1 GO TO ABC708.                     DMN3460
    MOVE SUPP-LIST-CODE TO N.                                          DMN3461
    PERFORM OUTPUT-STATEMENTS.                                         DMN3462
ABC708. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN3463
    IF BCC = 0 GO TO TBLL1.                                            DMN3464
    MOVE '      GO TO 4220$        ' TO CARD-AREA.                     DMN3465
    PERFORM WIND-UP.                                                   DMN3466
    GO TO TBLL2.                                                       DMN3467
TBLL1. MOVE ZERO TO ZORRO, NOTE NO-OP.                                 DMN3468
    MOVE ' 4174 IF (NV) 4150,4150,4176$                    ' TO        DMN3469
          CARD-AREA.                                                   DMN3470
    PERFORM WIND-UP.                                                   DMN3471
    MOVE CGT4-CODE TO N.                                               DMN3472
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           MOVE 1 TO PNU.                                                  DMN3473
           PERFORM UNPACK.                                                 DMN3474
           MOVE TEMPORARY TO INTERMEDIATE.                                 DMN3475
           MOVE 'NV       ' TO REG9.                                       DMN3476
           MOVE '04176' TO DSN.                                            DMN3477
           PERFORM GENERATE-CGT.                                           DMN3478
       TBLL2. MOVE ZERO TO ZORRO, NOTE NO-OP.                              DMN3479
           MOVE ' 4118 NS = 1$           ' TO CARD-AREA.                   DMN3480
           PERFORM WIND-UP.                                                DMN3481
           IF COND-NM = 0 GO TO ABC9.                                      DMN3482
           MOVE '      DO 4112 NV = 1,00000$                    ' TO       DMN3483
                CARD-AREA.                                                 DMN3484
           MOVE COND-NM TO AL5.                                            DMN3485
           MOVE A5 (1) TO CA (22).                                         DMN3486
           MOVE A5 (2) TO CA (23).                                         DMN3487
           MOVE A5 (3) TO CA (24).                                         DMN3488
           MOVE A5 (4) TO CA (25).                                         DMN3489
           MOVE A5 (5) TO CA (26).                                         DMN3490
           PERFORM WIND-UP.                                                DMN3491
           MOVE '      NP = 0$           ' TO CARD-AREA.                   DMN3492
           PERFORM WIND-UP.                                                DMN3493
           MOVE ' 4100 IF (NC(NV)) 4112,4112,4101$                  ' TO       DMN3494
                CARD-AREA.                                                 DMN3495
           PERFORM WIND-UP.                                                DMN3496
           MOVE CGT2-CODE TO N.                                            DMN3497
           MOVE 1 TO PNU.                                                  DMN3498
           PERFORM UNPACK.                                                 DMN3499
           MOVE TEMPORARY TO INTERMEDIATE.                                 DMN3500
           MOVE 'NV       ' TO REG9.                                       DMN3501
           MOVE '04101' TO DSN.                                            DMN3502
           PERFORM GENERATE-CGT.                                           DMN3503
           MOVE 0 TO PTM.                                                  DMN3504
           MOVE 1 TO PNU.                                                  DMN3505
           MOVE CONDITION-CODE TO N.                                       DMN3506
           PERFORM UNPACK.                                                 DMN3507
           GO TO EVC1.                                                     DMN3508
       EVC9. MOVE '      GO TO 4102$       ' TO CARD-AREA.                 DMN3509
           PERFORM WIND-UP.                                                DMN3510
       EVC1. ADD 1 TO PTM.                                                 DMN3511
           MOVE TM (PTM) TO DS (1).                                        DMN3512
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      ADD 1 TO PTM.                                                    DMN3513
      MOVE TM (PTM) TO DS (2).                                         DMN3514
      ADD 1 TO PTM.                                                    DMN3515
      MOVE TM (PTM) TO DS (3).                                         DMN3516
      ADD 1 TO PTM.                                                    DMN3517
      MOVE TM (PTM) TO DS (4).                                         DMN3518
      ADD 1 TO PTM.                                                    DMN3519
      MOVE TM (PTM) TO DS (5).                                         DMN3520
      MOVE '      OTP =                ' TO CARD-AREA.                 DMN3521
      MOVE 12 TO CAPT.                                                 DMN3522
      MOVE 8 TO PTR.                                                   DMN3523
      MOVE 0 TO BC.                                                    DMN3524
EVC3. ADD 1 TO PTR.                                                    DMN3525
      MOVE TR (PTR) TO A.                                              DMN3526
      ADD 1 TO CAPT.                                                   DMN3527
      IF A = '=' GO TO EVC3A.                                          DMN3528
      IF A = '(' ADD 1 TO BC.                                          DMN3529
      IF A = ')' SUBTRACT 1 FROM BC.                                   DMN3530
      IF A = ',' AND BC = 0 GO TO EVC3B.                               DMN3531
      MOVE A TO CA (CAPT).                                             DMN3532
      IF A NOT = '$' GO TO EVC3.                                       DMN3533
      GO TO EVC3B.                                                     DMN3534
EVC3A. MOVE '-' TO CA (CAPT).                                          DMN3535
      ADD 1 TO CAPT.                                                   DMN3536
      MOVE '(' TO CA (CAPT).                                           DMN3537
      GO TO EVC3.                                                      DMN3538
EVC3B. MOVE ')' TO CA (CAPT).                                          DMN3539
      ADD 1 TO CAPT.                                                   DMN3540
      MOVE '$' TO CA (CAPT).                                           DMN3541
      ALTER EVC4 TO PROCEED TO EVC6.                                   DMN3542
      IF TR (2) NOT = 'E' ALTER EVC4 TO PROCEED TO EVC5.               DMN3543
      MOVE CARD-AREA TO TEMPORARY.                                     DMN3544
      PERFORM TRANSLATE-CARD.                                          DMN3545
EVC4. GO TO EVC6.                                                      DMN3546
EVC5. MOVE '      NP = 1$              ' TO CARD-AREA.                 DMN3547
      PERFORM WIND-UP.                                                 DMN3548
EVC6. MOVE CONDITION-CODE TO N.                                        DMN3549
      PERFORM UNPACK.                                                  DMN3550
      IF PNU1 NOT = 1 GO TO EVC9.                                      DMN3551
      MOVE ' 4102 GO TO (4103,4111),NB$                    ' TO        DMN3552
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           CARD-AREA.                                                    DMN3553
      PERFORM WIND-UP.                                                   DMN3554
      MOVE ' 4103 IF (OD(NV)=OTP) 4104,4104,4111$          ' TO         DMN3555
           CARD-AREA.                                                    DMN3556
      PERFORM WIND-UP.                                                   DMN3557
      IF CCC = 0 GO TO EVC11.                                            DMN3558
      MOVE ' 4104 NM(NV)=NM(NV)-1$   ' TO CARD-AREA.                     DMN3559
      PERFORM WIND-UP.                                                   DMN3560
      MOVE '       IF (NM(NV))4105,4105,4111$                  ' TO      DMN3561
           CARD-AREA.                                                    DMN3562
      PERFORM WIND-UP.                                                   DMN3563
      GO TO EVC12.                                                       DMN3564
EVC11. MOVE ' 4104 CONTINUE$           ' TO CARD-AREA.                   DMN3565
      PERFORM WIND-UP.                                                   DMN3566
EVC12. MOVE '04105' TO DSN.                                              DMN3567
      PERFORM SAVE-REG.                                                  DMN3568
      MOVE '       CTEP=STEP$          ' TO CARD-AREA.                   DMN3569
      PERFORM WIND-UP.                                                   DMN3570
      IF X-FOUND = 0 GO TO CY1.                                          DMN3571
      PERFORM SAVE-REG-2.                                                DMN3572
      MOVE 0 TO PTM.                                                     DMN3573
      MOVE 1 TO PNU.                                                     DMN3574
      MOVE XACT-CODE TO N.                                               DMN3575
CY2. PERFORM UNPACK.                                                     DMN3576
      IF PNU1 = 1 GO TO CY3.                                             DMN3577
      IF TR (1) = '$' GO TO CY4.                                         DMN3578
      ADD 1 TO AVAILABLE-SNM.                                            DMN3579
      MOVE AVAILABLE-SNM TO AL5.                                         DMN3580
CY5. ADD 1 TO PTM.                                                       DMN3581
      MOVE A5 (1) TO TM (PTM).                                           DMN3582
      ADD 1 TO PTM.                                                      DMN3583
      MOVE A5 (2) TO TM (PTM).                                           DMN3584
      ADD 1 TO PTM.                                                      DMN3585
      MOVE A5 (3) TO TM (PTM).                                           DMN3586
      ADD 1 TO PTM.                                                      DMN3587
      MOVE A5 (4) TO TM (PTM).                                           DMN3588
      ADD 1 TO PTM.                                                      DMN3589
      MOVE A5 (5) TO TM (PTM).                                           DMN3590
      GO TO CY2.                                                         DMN3591
CY4. MOVE '04020' TO AL5.                                                DMN3592
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      GO TO CY5.                                                        DMN3593
 CY3. ADD 1 TO PTM.                                                     DMN3594
      MOVE '$' TO TM (PTM).                                             DMN3595
      MOVE 'NV        ' TO REG9.                                        DMN3596
      PERFORM GENERATE-CGT.                                             DMN3597
      MOVE 0 TO PTM.                                                    DMN3598
      MOVE 1 TO PNU.                                                    DMN3599
 CY6. MOVE XACT-CODE TO N.                                              DMN3600
      PERFORM UNPACK.                                                   DMN3601
      IF PNU1 = 1 GO TO CY7.                                            DMN3602
      IF TR (1) NOT = '$' GO TO CY61.                                   DMN3603
      ADD 5 TO PTM.                                                     DMN3604
      GO TO CY6.                                                        DMN3605
 CY61. ADD 1 TO PTM.                                                    DMN3606
      MOVE TM (PTM) TO DS (1).                                          DMN3607
      ADD 1 TO PTM.                                                     DMN3608
      MOVE TM (PTM) TO DS (2).                                          DMN3609
      ADD 1 TO PTM.                                                     DMN3610
      MOVE TM (PTM) TO DS (3).                                          DMN3611
      ADD 1 TO PTM.                                                     DMN3612
      MOVE TM (PTM) TO DS (4).                                          DMN3613
      ADD 1 TO PTM.                                                     DMN3614
      MOVE TM (PTM) TO DS (5).                                          DMN3615
      MOVE '      OZONE=              ' TO CARD-AREA.                   DMN3616
      MOVE 13 TO CAPT.                                                  DMN3617
      MOVE 0 TO PTR.                                                    DMN3618
 CY62. ADD 1 TO PTR.                                                    DMN3619
      MOVE TR (PTR) TO A.                                               DMN3620
      ADD 1 TO CAPT.                                                    DMN3621
      MOVE A TO CA (CAPT).                                              DMN3622
      IF A NOT = '$' GO TO CY62.                                        DMN3623
      PERFORM TRAN-NF1D.                                                DMN3624
      MOVE '      GO TO 4010$        ' TO CARD-AREA.                    DMN3625
      PERFORM WIND-UP.                                                  DMN3626
      GO TO CY6.                                                        DMN3627
 CY7. MOVE ' 4010 DO 4011 NK=1,NDE$ ' TO CARD-AREA.                     DMN3628
      PERFORM WIND-UP.                                                  DMN3629
      MOVE ' 4011 DY(NK,NF1)=DY(NK,NF1D)/OZONE$                ' TO     DMN3630
           CARD-AREA.                                                   DMN3631
      PERFORM WIND-UP.                                                  DMN3632
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     MOVE '       STEP=-OD(NV)$       ' TO CARD-AREA.                    DMN3633
     PERFORM WIND-UP.                                                    DMN3634
     MOVE '       GO TO 4801$         ' TO CARD-AREA.                    DMN3635
     PERFORM WIND-UP.                                                    DMN3636
     IF L-FOUND = 0 GO TO CY11.                                          DMN3637
     MOVE ' 4020 DO 4021 NK=1,NDE$ ' TO CARD-AREA.                       DMN3638
     PERFORM WIND-UP.                                                    DMN3639
     MOVE ' 4021 OY(NK,NF1)=OY(NK,NF1D)$                          ' TO   DMN3640
          CARD-AREA.                                                     DMN3641
     PERFORM WIND-UP.                                                    DMN3642
CY1. MOVE ZERO TO ZORRO, NOTE NO-OP.                                     DMN3643
     MOVE '       STEP = STEP*OD(NV)/(OD(NV)-OTP)$                ' TO   DMN3644
          CARD-AREA.                                                     DMN3645
     PERFORM WIND-UP.                                                    DMN3646
     MOVE '       GO TO 4801$         ' TO CARD-AREA.                    DMN3647
     PERFORM WIND-UP.                                                    DMN3648
CY11. MOVE ZERO TO ZORRO, NOTE NO-OP.                                    DMN3649
     IF BCC = 0 GO TO EVC13.                                             DMN3650
     MOVE 1 TO PNU.                                                      DMN3651
     MOVE SUB-LIST-CODE TO N.                                            DMN3652
     PERFORM UNPACK.                                                     DMN3653
     MOVE TEMPORARY TO INTERMEDIATE.                                     DMN3654
     MOVE 0 TO PTM.                                                      DMN3655
     MOVE 1 TO PNU.                                                      DMN3656
     MOVE SUB-BC-CODE TO N.                                              DMN3657
     PERFORM UNPACK.                                                     DMN3658
     GO TO EVC14.                                                        DMN3659
EVC15. MOVE '       GO TO 4108$         ' TO CARD-AREA.                  DMN3660
     PERFORM WIND-UP.                                                    DMN3661
EVC14. ADD 1 TO PTM.                                                     DMN3662
     MOVE TM (PTM) TO DS (1).                                            DMN3663
     ADD 1 TO PTM.                                                       DMN3664
     MOVE TM (PTM) TO DS (2).                                            DMN3665
     ADD 1 TO PTM.                                                       DMN3666
     MOVE TM (PTM) TO DS (3).                                            DMN3667
     ADD 1 TO PTM.                                                       DMN3668
     MOVE TM (PTM) TO DS (4).                                            DMN3669
     ADD 1 TO PTM.                                                       DMN3670
     MOVE TM (PTM) TO DS (5).                                            DMN3671
EVC14A. MOVE '       000000 =            ' TO CARD-AREA.                 DMN3672
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      MOVE TR (6) TO CA (8).                                          DMN3673
      MOVE TR (7) TO CA (9).                                          DMN3674
      MOVE TR (8) TO CA (10).                                         DMN3675
      MOVE TR (9) TO CA (11).                                         DMN3676
      MOVE TR (10) TO CA (12).                                        DMN3677
      MOVE 15 TO CAPT.                                                DMN3678
      MOVE 10 TO PTR.                                                 DMN3679
  EVC50. ADD 1 TO PTR.                                                DMN3680
      MOVE TR (PTR) TO A.                                             DMN3681
      ADD 1 TO CAPT.                                                  DMN3682
      MOVE A TO CA (CAPT).                                            DMN3683
      IF A NOT = '$' GO TO EVC50.                                     DMN3684
      MOVE CARD-AREA TO TEMPORARY.                                    DMN3685
      PERFORM TRANSLATE-CARD.                                         DMN3686
      MOVE SUB-BC-CODE TO N.                                          DMN3687
      PERFORM UNPACK.                                                 DMN3688
      IF PNU1 = 1 GO TO EVC13.                                        DMN3689
      IF TR (1) NOT = 'X' GO TO EVC15.                                DMN3690
      GO TO EVC14A.                                                   DMN3691
  EVC13. MOVE ZERO TO ZORRO, NOTE NO-OP.                              DMN3692
      MOVE ' 4108 STEP = OTEP$       ' TO CARD-AREA.                  DMN3693
      PERFORM WIND-UP.                                                DMN3694
      PERFORM SAVE-REG.                                               DMN3695
      IF X-FOUND = 1 PERFORM SAVE-REG-2.                              DMN3696
      MOVE '      NC(NV)=O$          ' TO CARD-AREA.                  DMN3697
      PERFORM WIND-UP.                                                DMN3698
      MOVE '      GO TO 4112$        ' TO CARD-AREA.                  DMN3699
      PERFORM WIND-UP.                                                DMN3700
      MOVE ' 4111 OD(NV)=OTP$        ' TO CARD-AREA.                  DMN3701
      PERFORM WIND-UP.                                                DMN3702
      MOVE '      NS=NS*NP$          ' TO CARD-AREA.                  DMN3703
      PERFORM WIND-UP.                                                DMN3704
      MOVE ' 4112 CONTINUE$          ' TO CARD-AREA.                  DMN3705
      PERFORM WIND-UP.                                                DMN3706
  ABC9. MOVE ZERO TO ZORRO, NOTE NO-OP.                               DMN3707
      IF FRED = 1 AND FDX = 1 GO TO OUF1.                             DMN3708
      GO TO OUFE.                                                     DMN3709
  OUF1. MOVE '      NV = 00000$        ' TO CARD-AREA.                DMN3710
      COMPUTE NM5 = COND-NM + 1.                                      DMN3711
      MOVE NM5 TO AL5.                                                DMN3712
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           MOVE A5 (1) TO CA (12).                                          DMN3713
           MOVE A5 (2) TO CA (13).                                          DMN3714
           MOVE A5 (3) TO CA (14).                                          DMN3715
           MOVE A5 (4) TO CA (15).                                          DMN3716
           MOVE A5 (5) TO CA (16).                                          DMN3717
           PERFORM WIND-UP.                                                 DMN3718
           MOVE '      GO TO (4133,4142), NB$                    ' TO       DMN3719
                 CARD-AREA.                                                 DMN3720
           PERFORM WIND-UP.                                                 DMN3721
           MOVE ' 4133 OPT = OFR + STEP$ ' TO CARD-AREA.                    DMN3722
           PERFORM WIND-UP.                                                 DMN3723
           MOVE '      IF(OFR*OPT) 4134,4134,4141$                ' TO      DMN3724
                 CARD-AREA.                                                 DMN3725
           PERFORM WIND-UP.                                                 DMN3726
           MOVE '04134' TO DSN.                                             DMN3727
           PERFORM SAVE-REG.                                                DMN3728
           MOVE '      OTEP = STEP$       ' TO CARD-AREA.                   DMN3729
           PERFORM WIND-UP.                                                 DMN3730
           MOVE '      STEP = -OFR$       ' TO CARD-AREA.                   DMN3731
           PERFORM WIND-UP.                                                 DMN3732
           MOVE '      GO TO 4801$        ' TO CARD-AREA.                   DMN3733
           PERFORM WIND-UP.                                                 DMN3734
           MOVE ' 4138 STEP = OTEP$       ' TO CARD-AREA.                   DMN3735
           PERFORM WIND-UP.                                                 DMN3736
           PERFORM SAVE-REG.                                                DMN3737
           MOVE '      OFR = OFR -(       ' TO CARD-AREA.                   DMN3738
           MOVE 1 TO PNU.                                                   DMN3739
           MOVE FREQ-CODE TO N.                                             DMN3740
           PERFORM UNPACK.                                                  DMN3741
           MOVE 0 TO PTR.                                                   DMN3742
           MOVE 18 TO CAPT.                                                 DMN3743
       OUF2. ADD 1 TO PTR.                                                  DMN3744
           MOVE TR (PTR) TO A.                                              DMN3745
           IF A = '$' GO TO OUF3.                                           DMN3746
           ADD 1 TO CAPT.                                                   DMN3747
           MOVE A TO CA (CAPT).                                             DMN3748
           GO TO OUF2.                                                      DMN3749
       OUF3. ADD 1 TO CAPT.                                                 DMN3750
           MOVE ')' TO CA (CAPT).                                           DMN3751
           ADD 1 TO CAPT.                                                   DMN3752
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      MOVE '$' TO CA (CAPT).                                          DMN3753
      PERFORM WIND-UP.                                                DMN3754
      MOVE '      GO TO 4133$       ' TO CARD-AREA.                   DMN3755
      PERFORM WIND-UP.                                                DMN3756
      MOVE ' 4141 GFR = OPT$        ' TO CARD-AREA.                   DMN3757
      PERFORM WIND-UP.                                                DMN3758
      MOVE ' 4142 CONTINUE$         ' TO CARD-AREA.                   DMN3759
      PERFORM WIND-UP.                                                DMN3760
 OUFE. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN3761
      MOVE '      NB = 1$           ' TO CARD-AREA.                   DMN3762
      PERFORM WIND-UP.                                                DMN3763
      MOVE '      NV = 0$           ' TO CARD-AREA.                   DMN3764
      PERFORM WIND-UP.                                                DMN3765
      MOVE '      IF(NS) 4160,4160,4161$                    ' TO      DMN3766
           CARD-AREA.                                                 DMN3767
      PERFORM WIND-UP.                                                DMN3768
      IF FRED = 1 GO TO OUX1.                                         DMN3769
      MOVE ' 4160 GO TO 4170$       ' TO CARD-AREA.                   DMN3770
      IF BCC NOT = 0 MOVE '3' TO CA (16).                             DMN3771
      PERFORM WIND-UP.                                                DMN3772
      GO TO OUX99.                                                    DMN3773
 OUX1. IF FDX = 1 GO TO OUX2.                                         DMN3774
      MOVE ' 4160 NQ=NQ-1$          ' TO CARD-AREA.                   DMN3775
      PERFORM WIND-UP.                                                DMN3776
      MOVE '      IF (NQ) 4162,4162,4150$                   ' TO      DMN3777
           CARD-AREA.                                                 DMN3778
      PERFORM WIND-UP.                                                DMN3779
      MOVE ' 4162 NQ =              ' TO CARD-AREA.                   DMN3780
      MOVE 1 TO PNU.                                                  DMN3781
      MOVE FREG-CODE TO N.                                            DMN3782
      PERFORM UNPACK.                                                 DMN3783
      MOVE 0 TO PTR.                                                  DMN3784
      MOVE 11 TO CAPT.                                                DMN3785
 OUX11. ADD 1 TO PTR.                                                 DMN3786
      MOVE TR (PTR) TO A.                                             DMN3787
      ADD 1 TO CAPT.                                                  DMN3788
      MOVE A TO CA (CAPT).                                            DMN3789
      IF A NOT = '$' GO TO OUX11.                                     DMN3790
      PERFORM WIND-UP.                                                DMN3791
      MOVE '      GO TO 4170$       ' TO CARD-AREA.                   DMN3792
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    IF BCC NOT = 0 MOVE '3' TO CA (16).                          DMN3793
    PERFORM WIND-UP.                                             DMN3794
    GO TO OUX99.                                                 DMN3795
OUX2. MOVE ' 4160 CONTINUE$          ' TO CARD-AREA.             DMN3796
    PERFORM WIND-UP.                                             DMN3797
OUX99. MOVE ZERO TO ZORRO, NOTE NO-OP.                           DMN3798
    MOVE '04150' TO DSN.                                         DMN3799
    IF MTYPE = 'P' GO TO MEG-MEG.                                DMN3800
    MOVE '      GO TO 4800$        ' TO CARD-AREA.               DMN3801
    PERFORM WIND-UP.                                             DMN3802
    GO TO MEG-GEM.                                               DMN3803
MEG-MEG. MOVE CGT7-CODE TO N.                                    DMN3804
    MOVE '$' TO TM (1).                                          DMN3805
    MOVE 1 TO TMPT.                                              DMN3806
    MOVE 1 TO PNU.                                               DMN3807
MEG-MEG41. PERFORM UNPACK.                                       DMN3808
    IF PNU1 EQUAL 1 GO TO MEG-MEG42.                             DMN3809
    SUBTRACT 1 FROM TMPT.                                        DMN3810
    MOVE 0 TO PTR.                                               DMN3811
MEG-MEG43. ADD 1 TO TMPT.                                        DMN3812
    ADD 1 TO PTR.                                                DMN3813
    MOVE TR (PTR) TO TM (TMPT).                                  DMN3814
    IF TR (PTR) NOT EQUAL '$' GO TO MEG-MEG43.                   DMN3815
    GO TO MEG-MEG41.                                             DMN3816
MEG-MEG42. MOVE 'NPC       ' TO REG9.                            DMN3817
    PERFORM GENERATE-CGT.                                        DMN3818
MEG-GEM. MOVE ZERO TO ZORRO, NOTE NO-OP.                         DMN3819
    MOVE ' 4161 CONTINUE$          ' TO CARD-AREA.               DMN3820
    PERFORM WIND-UP.                                             DMN3821
    IF BCC = 0 GO TO SKIP-ITERATIONS.                            DMN3822
    MOVE FCONTROL TO CARD-AREA.                                  DMN3823
    MOVE '$' TO CA (50).                                         DMN3824
    PERFORM WIND-UP.                                             DMN3825
    MOVE 1 TO PNU.                                               DMN3826
    MOVE BOUND-EQ-CODE TO N.                                     DMN3827
EV8. PERFORM UNPACK.                                             DMN3828
    IF PNU1 = 1 GO TO EV81.                                      DMN3829
    MOVE TEMPORARY TO CARD-AREA.                                 DMN3830
    PERFORM WIND-UP.                                             DMN3831
    GO TO EV8.                                                   DMN3832
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 EVB1. MOVE '      IF(NJ-1) 4182,4205,4182$                    ' TO  DMN3833
            CARD-AREA.                                               DMN3834
     PERFORM WIND-UP.                                                DMN3835
     MOVE ' 4182 DO 4183 NK=1,00000$                    ' TO         DMN3836
            CARD-AREA.                                               DMN3837
     MOVE BCC TO AL5.                                                DMN3838
     MOVE A5 (1) TO CA (20).                                         DMN3839
     MOVE A5 (2) TO CA (21).                                         DMN3840
     MOVE A5 (3) TO CA (22).                                         DMN3841
     MOVE A5 (4) TO CA (23).                                         DMN3842
     MOVE A5 (5) TO CA (24).                                         DMN3843
     PERFORM WIND-UP.                                                DMN3844
     MOVE ' 4183 SIDW(NK,NJ-1) = (SIDW(NK,00000)-ON(NK))/ODEL$       DMN3845
-'                  ' TO CARD-AREA.                                  DMN3846
     COMPUTE NM5 = BCC + 1.                                          DMN3847
     MOVE NM5 TO AL5.                                                DMN3848
     MOVE A5 (1) TO CA (32).                                         DMN3849
     MOVE A5 (2) TO CA (33).                                         DMN3850
     MOVE A5 (3) TO CA (34).                                         DMN3851
     MOVE A5 (4) TO CA (35).                                         DMN3852
     MOVE A5 (5) TO CA (36).                                         DMN3853
     PERFORM WIND-UP.                                                DMN3854
     MOVE '      IF(NJ-00000) 4180,4184,4184$                ' TO  DMN3855
            CARD-AREA.                                               DMN3856
     COMPUTE NM5 = BCC + 1.                                          DMN3857
     MOVE NM5 TO AL5.                                                DMN3858
     MOVE A5 (1) TO CA (13).                                         DMN3859
     MOVE A5 (2) TO CA (14).                                         DMN3860
     MOVE A5 (3) TO CA (15).                                         DMN3861
     MOVE A5 (4) TO CA (16).                                         DMN3862
     MOVE A5 (5) TO CA (17).                                         DMN3863
     PERFORM WIND-UP.                                                DMN3864
     IF BCC = 1 GO TO EVB10.                                         DMN3865
     IF BCC = 2 GO TO EVB20.                                         DMN3866
 EVB30. MOVE 'C THE FOLLOWING BLOCK IS DUE TO JOHN POLLARD.$  ' TO DMN3867
            CARD-AREA.                                               DMN3868
     PERFORM WIND-UP.                                                DMN3869
     MOVE ' 4184 MSID = 00000$      ' TO CARD-AREA.                  DMN3870
     MOVE BCC TO AL5.                                                DMN3871
     MOVE A5 (1) TO CA (14).                                         DMN3872
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      MOVE A5 (2) TO CA (15).                                          DMN3873
      MOVE A5 (3) TO CA (16).                                          DMN3874
      MOVE A5 (4) TO CA (17).                                          DMN3875
      MOVE A5 (5) TO CA (18).                                          DMN3876
      PERFORM WIND-UP.                                                 DMN3877
      MOVE '      NSID = 00000$      ' TO CARD-AREA.                   DMN3878
      COMPUTE NM5 = BCC + 1.                                           DMN3879
      MOVE NM5 TO AL5.                                                 DMN3880
      MOVE A5 (1) TO CA (14).                                          DMN3881
      MOVE A5 (2) TO CA (15).                                          DMN3882
      MOVE A5 (3) TO CA (16).                                          DMN3883
      MOVE A5 (4) TO CA (17).                                          DMN3884
      MOVE A5 (5) TO CA (18).                                          DMN3885
      PERFORM WIND-UP.                                                 DMN3886
      MOVE '      LSID = 1$          ' TO CARD-AREA.                   DMN3887
      PERFORM WIND-UP.                                                 DMN3888
      MOVE '      DIMENSION IFSID(00000),ILSID(00000),IGSID(00000)$    DMN3889
     -'               ' TO CARD-AREA.                                   DMN3890
      MOVE BCC TO AL5.                                                 DMN3891
      MOVE A5 (1) TO CA (23), CA (36).                                 DMN3892
      MOVE A5 (2) TO CA (24), CA (37).                                 DMN3893
      MOVE A5 (3) TO CA (25), CA (38).                                 DMN3894
      MOVE A5 (4) TO CA (26), CA (39).                                 DMN3895
      MOVE A5 (5) TO CA (27), CA (40).                                 DMN3896
      MOVE A5 (1) TO CA (49).                                          DMN3897
      MOVE A5 (2) TO CA (50).                                          DMN3898
      MOVE A5 (3) TO CA (51).                                          DMN3899
      MOVE A5 (4) TO CA (52).                                          DMN3900
      MOVE A5 (5) TO CA (53).                                          DMN3901
      PERFORM WIND-UP.                                                 DMN3902
      MOVE ' 8800 SIDET=1.$          ' TO CARD-AREA.                   DMN3903
      PERFORM WIND-UP.                                                 DMN3904
      MOVE '      ISID1=MSID-1$      ' TO CARD-AREA.                   DMN3905
      PERFORM WIND-UP.                                                 DMN3906
      MOVE '      ISIDR=NSID-MSID$   ' TO CARD-AREA.                   DMN3907
      PERFORM WIND-UP.                                                 DMN3908
      MOVE '      IF(ISIDR)8802,8851,8851$                  ' TO       DMN3909
             CARD-AREA.                                                DMN3910
      PERFORM WIND-UP.                                                 DMN3911
      MOVE ' 8851 DO 8822 KSID=1,MSID$                      ' TO       DMN3912
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        CARD-AREA.                                                    DMN3913
PERFORM WIND-UP.                                                      DMN3914
MOVE '      ILSID(KSID)=0$     ' TO CARD-AREA.                        DMN3915
PERFORM WIND-UP.                                                      DMN3916
MOVE ' 8822 IGSID(KSID)=KSID$ ' TO CARD-AREA.                         DMN3917
PERFORM WIND-UP.                                                      DMN3918
MOVE '      DO 8803 KSID=1,MSID$                          ' TO        DMN3919
        CARD-AREA.                                                    DMN3920
PERFORM WIND-UP.                                                      DMN3921
MOVE '      IF(ILSID)8852,8853,8853$                      ' TO        DMN3922
        CARD-AREA.                                                    DMN3923
PERFORM WIND-UP.                                                      DMN3924
MOVE ' 8852 KSID1=1$           ' TO CARD-AREA.                        DMN3925
PERFORM WIND-UP.                                                      DMN3926
MOVE '      GO TO 8854$        ' TO CARD-AREA.                        DMN3927
PERFORM WIND-UP.                                                      DMN3928
MOVE ' 8853 KSID1=KSID+1$      ' TO CARD-AREA.                        DMN3929
PERFORM WIND-UP.                                                      DMN3930
MOVE ' 8854 RSID=0.$           ' TO CARD-AREA.                        DMN3931
PERFORM WIND-UP.                                                      DMN3932
MOVE '      DO 8804 ISID=1,MSID$                          ' TO        DMN3933
        CARD-AREA.                                                    DMN3934
PERFORM WIND-UP.                                                      DMN3935
MOVE '      IF(ILSID(ISID))8804,8805,8804$                ' TO        DMN3936
        CARD-AREA.                                                    DMN3937
PERFORM WIND-UP.                                                      DMN3938
MOVE ' 8805 WSID=SIDW(ISID,KSID)$                         ' TO        DMN3939
        CARD-AREA.                                                    DMN3940
PERFORM WIND-UP.                                                      DMN3941
MOVE '      XSID=WSID$         ' TO CARD-AREA.                        DMN3942
PERFORM WIND-UP.                                                      DMN3943
MOVE '      IF(XSID)8806,8807,8807$                       ' TO        DMN3944
        CARD-AREA.                                                    DMN3945
PERFORM WIND-UP.                                                      DMN3946
MOVE ' 8806 XSID=-XSID$        ' TO CARD-AREA.                        DMN3947
PERFORM WIND-UP.                                                      DMN3948
MOVE ' 8807 IF(XSID-RSID)8804,8808,8808$                  ' TO        DMN3949
        CARD-AREA.                                                    DMN3950
PERFORM WIND-UP.                                                      DMN3951
MOVE ' 8808 RSID=XSID$         ' TO CARD-AREA.                        DMN3952
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      PERFORM WIND-UP.                                                  DMN3953
      MOVE '      PSID=WSID$          ' TO CARD-AREA.                   DMN3954
      PERFORM WIND-UP.                                                  DMN3955
      MOVE '      KFSID=ISID$         ' TO CARD-AREA.                   DMN3956
      PERFORM WIND-UP.                                                  DMN3957
      MOVE ' 8804 CONTINUE$           ' TO CARD-AREA.                   DMN3958
      PERFORM WIND-UP.                                                  DMN3959
      MOVE '      IFSID(KSID)=KFSID$' TO CARD-AREA.                     DMN3960
      PERFORM WIND-UP.                                                  DMN3961
      MOVE '      ILSID(KFSID)=KFSID$                           ' TO    DMN3962
           CARD-AREA.                                                   DMN3963
      PERFORM WIND-UP.                                                  DMN3964
      MOVE '      SIDET=SIDET*PSID$ ' TO CARD-AREA.                     DMN3965
      PERFORM WIND-UP.                                                  DMN3966
      MOVE '      IF(SIDET)8810,8811,8810$                      ' TO    DMN3967
           CARD-AREA.                                                   DMN3968
      PERFORM WIND-UP.                                                  DMN3969
      MOVE ' 8811 IF(LSID)8802,8801,8802$                       ' TO    DMN3970
           CARD-AREA.                                                   DMN3971
      PERFORM WIND-UP.                                                  DMN3972
      MOVE ' 8810 DO 8815 ISID=1,MSID$                          ' TO    DMN3973
           CARD-AREA.                                                   DMN3974
      PERFORM WIND-UP.                                                  DMN3975
      MOVE '      IF(ISID-KFSID)8855,8856,8855$                 ' TO    DMN3976
           CARD-AREA.                                                   DMN3977
      PERFORM WIND-UP.                                                  DMN3978
      MOVE ' 8856 SIDW(ISID,KSID)=1./PSID$                      ' TO    DMN3979
           CARD-AREA.                                                   DMN3980
      PERFORM WIND-UP.                                                  DMN3981
      MOVE '      GO TO 8815$         ' TO CARD-AREA.                   DMN3982
      PERFORM WIND-UP.                                                  DMN3983
      MOVE ' 8855 SIDW(ISID,KSID)=-SIDW(ISID,KSID)/PSID$        ' TO    DMN3984
           CARD-AREA.                                                   DMN3985
      PERFORM WIND-UP.                                                  DMN3986
      MOVE ' 8815 CONTINUE$           ' TO CARD-AREA.                   DMN3987
      PERFORM WIND-UP.                                                  DMN3988
      MOVE '      IF(KSID1-NSID)8870,8870,8803$                 ' TO    DMN3989
           CARD-AREA.                                                   DMN3990
      PERFORM WIND-UP.                                                  DMN3991
      MOVE ' 8870 DO 8825 JSID = KSID1,NSID$                    ' TO    DMN3992
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           CARD-AREA.                                                    DMN3993
     PERFORM WIND-UP.                                                    DMN3994
     MOVE '      IF(JSID-KSID)8858,8825,8858$                 ' TO      DMN3995
           CARD-AREA.                                                    DMN3996
     PERFORM WIND-UP.                                                    DMN3997
     MOVE ' 8858 WSID=SIDW(KFSID,JSID)$                       ' TO      DMN3998
           CARD-AREA.                                                    DMN3999
     PERFORM WIND-UP.                                                    DMN4000
     MOVE '      IF(WSID)8821,8825,8821$                      ' TO      DMN4001
           CARD-AREA.                                                    DMN4002
     PERFORM WIND-UP.                                                    DMN4003
     MOVE ' 8821 DO 8820 ISID=1,MSID$                         ' TO      DMN4004
           CARD-AREA.                                                    DMN4005
     PERFORM WIND-UP.                                                    DMN4006
     MOVE '      IF(ISID-KFSID)8823,8824,8823$                ' TO      DMN4007
           CARD-AREA.                                                    DMN4008
     PERFORM WIND-UP.                                                    DMN4009
     MOVE ' 8824 SIDW(ISID,JSID)=WSID/PSID$                   ' TO      DMN4010
           CARD-AREA.                                                    DMN4011
     PERFORM WIND-UP.                                                    DMN4012
     MOVE '      GO TO 8820$       ' TO CARD-AREA.                       DMN4013
     PERFORM WIND-UP.                                                    DMN4014
     MOVE ' 8823 SIDW(ISID,JSID)=SIDW(ISID,JSID)+WSID*SIDW(ISID,KS       DMN4015
-'ID)$            ' TO CARD-AREA.                                        DMN4016
     PERFORM WIND-UP.                                                    DMN4017
     MOVE ' 8820 CONTINUE$          ' TO CARD-AREA.                      DMN4018
     PERFORM WIND-UP.                                                    DMN4019
     MOVE ' 8825 CONTINUE$          ' TO CARD-AREA.                      DMN4020
     PERFORM WIND-UP.                                                    DMN4021
     MOVE ' 8803 CONTINUE$          ' TO CARD-AREA.                      DMN4022
     PERFORM WIND-UP.                                                    DMN4023
     MOVE '      DO 8840 KSID=1,ISID1$                        ' TO      DMN4024
           CARD-AREA.                                                    DMN4025
     PERFORM WIND-UP.                                                    DMN4026
     MOVE '      KFSID=IFSID(KSID)$' TO CARD-AREA.                       DMN4027
     PERFORM WIND-UP.                                                    DMN4028
     MOVE '      KLSID-ILSID(KFSID)$                          ' TO      DMN4029
           CARD AREA.                                                    DMN4030
     PERFORM WIND-UP.                                                    DMN4031
     MOVE '      KGSID=IGSID(KSID)$' TO CARD-AREA.                       DMN4032
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      PERFORM WIND-UP.                                                  DMN4033
      MOVE '      IF(KFSID-KGSID)8841,8840,8841$                ' TO    DMN4034
            CARD-AREA                                                   DMN4035
      PERFORM WIND-UP.                                                  DMN4036
      MOVE ' 8841 IF(LSID)8842,8843,8844$                       ' TO    DMN4037
            CARD-AREA.                                                  DMN4038
      PERFORM WIND-UP.                                                  DMN4039
      MOVE ' 8844 IF(ISIDR)8802,8843,8846$                      ' TO    DMN4040
            CARD-AREA.                                                  DMN4041
      PERFORM WIND-UP.                                                  DMN4042
      MOVE ' 8842 DO 8861 ISID=1,MSID$                          ' TO    DMN4043
            CARD-AREA.                                                  DMN4044
      PERFORM WIND-UP.                                                  DMN4045
      MOVE '      RSID=SIDW(ISID,KFSID)$                        ' TO    DMN4046
            CARD-AREA.                                                  DMN4047
      PERFORM WIND-UP.                                                  DMN4048
      MOVE '      WSID=SIDW(ISID,KGSID)$                        ' TO    DMN4049
            CARD-AREA.                                                  DMN4050
      PERFORM WIND-UP.                                                  DMN4051
      MOVE '      SIDW(ISID,KFSID)=WSID$                        ' TO    DMN4052
            CARD-AREA.                                                  DMN4053
      PERFORM WIND-UP.                                                  DMN4054
      MOVE ' 8861 SIDW(ISID,KGSID)=RSID$                        ' TO    DMN4055
            CARD-AREA.                                                  DMN4056
      PERFORM WIND-UP.                                                  DMN4057
      MOVE ' 8846 DO 8860 JSID=1,NSID$                          ' TO    DMN4058
            CARD-AREA.                                                  DMN4059
      PERFORM WIND-UP.                                                  DMN4060
      MOVE '      RSID=SIDW(KSID,JSID)$                         ' TO    DMN4061
            CARD-AREA.                                                  DMN4062
      PERFORM WIND-UP.                                                  DMN4063
      MOVE '      WSID=SIDW(KLSID,JSID)$                        ' TO    DMN4064
            CARD-AREA.                                                  DMN4065
      PERFORM WIND-UP.                                                  DMN4066
      MOVE '      SIDW(KSID,JSID)=WSID$                         ' TO    DMN4067
            CARD-AREA.                                                  DMN4068
      PERFORM WIND-UP.                                                  DMN4069
      MOVE ' 8860 SIDW(KLSID,JSID)=RSID$                        ' TO    DMN4070
            CARD-AREA.                                                  DMN4071
      PERFORM WIND-UP.                                                  DMN4072
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      MOVE ' 8843 ILSID(KFSID)=KSID$' TO CARD-AREA.                    DMN4073
      PERFORM WIND-UP.                                                 DMN4074
      MOVE '       ILSID(KGSID)=KLSID$                          ' TO   DMN4075
             CARD-AREA.                                                DMN4076
      PERFORM WIND-UP.                                                 DMN4077
      MOVE '       IGSID(KLSID)=IGSID(KSID)$                    ' TO   DMN4078
             CARD-AREA.                                                DMN4079
      PERFORM WIND-UP.                                                 DMN4080
      MOVE '       IGSID(KSID)=KFSID$' TO CARD-AREA.                   DMN4081
      PERFORM WIND-UP.                                                 DMN4082
      MOVE '       SIDET=-SIDET$      ' TO CARD-AREA.                  DMN4083
      PERFORM WIND-UP.                                                 DMN4084
      MOVE ' 8840 CONTINUE$           ' TO CARD-AREA.                  DMN4085
      PERFORM WIND-UP.                                                 DMN4086
      MOVE '       GO TO 8801$        ' TO CARD-AREA.                  DMN4087
      PERFORM WIND-UP.                                                 DMN4088
      MOVE '08801' TO DSN.                                             DMN4089
      GO TO ABC5.                                                      DMN4090
 EVB10. MOVE ' 4184 IF(SIDW(1,1)) 8803,8802,8803$                 ' TO DMN4091
             CARD-AREA.                                                DMN4092
      PERFORM WIND-UP.                                                 DMN4093
      MOVE ' 8803 SIDW(1,2)=SIDW(1,2)/SIDW(1,1)$                ' TO   DMN4094
             CARD-AREA.                                                DMN4095
      PERFORM WIND-UP.                                                 DMN4096
      GO TO ABC5.                                                      DMN4097
 EVB20. MOVE ' 4184 OZ = SIDW(1,1)*SIDW(2,2)-SIDW(2,1)*SIDW(1,2)$      DMN4098
-'                    ' TO CARD-AREA.                                   DMN4099
      PERFORM WIND-UP.                                                 DMN4100
      MOVE '       IF(OZ) 8803,8802,8803$                       ' TO   DMN4101
             CARD-AREA.                                                DMN4102
      PERFORM WIND-UP.                                                 DMN4103
      MOVE ' 8803 ODEL =(SIDW(1,3)*SIDW(2,2)-SIDW(2,3)*SIDW(1,2))/O    DMN4104
-'Z$                  ' TO CARD-AREA.                                   DMN4105
      PERFORM WIND-UP.                                                 DMN4106
      MOVE '       SIDW(2,3) =(SIDW(2,3)*SIDW(1,1)-SIDW(1,3)*SIDW(2,   DMN4107
-'1))/OZ$             ' TO CARD-AREA.                                   DMN4108
      PERFORM WIND-UP.                                                 DMN4109
      MOVE '       SIDW(1,3) = ODEL$ ' TO CARD-AREA.                   DMN4110
      PERFORM WIND-UP.                                                 DMN4111
 ABC5. MOVE '       DO 4185 NK = 1,00000$                        ' TO  DMN4112
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           CARD-AREA.                                                    DMN4113
      MOVE BCC TO AL5.                                                   DMN4114
      MOVE A5 (1) TO CA (22).                                            DMN4115
      MOVE A5 (2) TO CA (23).                                            DMN4116
      MOVE A5 (3) TO CA (24).                                            DMN4117
      MOVE A5 (4) TO CA (25).                                            DMN4118
      MOVE A5 (5) TO CA (26).                                            DMN4119
      PERFORM WIND-UP.                                                   DMN4120
      MOVE ' 4185 OI(NK) = OI(NK) + SIDW(NK,00000)$          ' TO        DMN4121
           CARD-AREA.                                                    DMN4122
      COMPUTE NM5 = BCC + 1.                                             DMN4123
      MOVE NM5 TO AL5.                                                   DMN4124
      MOVE A5 (1) TO CA (33).                                            DMN4125
      MOVE A5 (2) TO CA (34).                                            DMN4126
      MOVE A5 (3) TO CA (35).                                            DMN4127
      MOVE A5 (4) TO CA (36).                                            DMN4128
      MOVE A5 (5) TO CA (37).                                            DMN4129
      MOVE 1 TO PNU.                                                     DMN4130
      MOVE REL-CODE TO N.                                                DMN4131
      PERFORM UNPACK.                                                    DMN4132
      IF PNU1 = 1 GO TO ALLBRAN.                                         DMN4133
      MOVE 0 TO PTR.                                                     DMN4134
ALLBRAN1. ADD 1 TO PTR.                                                  DMN4135
      MOVE TR (PTR) TO A.                                                DMN4136
      IF A = '$' GO TO ALLBRAN.                                          DMN4137
      IF A NOT = '(' GO TO ALLBRAN1.                                     DMN4138
      SUBTRACT 1 FROM PTR.                                               DMN4139
      MOVE '*' TO CA (39).                                               DMN4140
      MOVE 39 TO CAPT.                                                   DMN4141
ALLBRAN2. ADD 1 TO PTR.                                                  DMN4142
      MOVE TR (PTR) TO A.                                                DMN4143
      ADD 1 TO CAPT.                                                     DMN4144
      MOVE A TO CA (CAPT).                                               DMN4145
      IF A NOT = '$' GO TO ALLBRAN2.                                     DMN4146
ALLBRAN. MOVE ZERO TO ZORRO, NOTE NO-OP.                                 DMN4147
      PERFORM WIND-UP.                                                   DMN4148
      MOVE '      GO TO 4186$        ' TO CARD-AREA.                     DMN4149
      PERFORM WIND-UP.                                                   DMN4150
      MOVE ' 4030 FORMAT(18H  ZERO DETERMINANT)$             ' TO        DMN4151
           CARD-AREA.                                                    DMN4152
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      PERFORM WIND-UP.                                                  DMN4153
      MOVE '08802' TO DSN.                                              DMN4154
      MOVE 1 TO PNU.                                                    DMN4155
 C8812. MOVE BCD-OUT-CODE TO N.                                         DMN4156
      PERFORM UNPACK.                                                   DMN4157
      IF PNU1 = 1 GO TO C8812A.                                         DMN4158
      MOVE '04030' TO AL5.                                              DMN4159
      PERFORM MVOUSTM.                                                  DMN4160
      ADD 1 TO CNPT.                                                    DMN4161
      MOVE '$' TO CN (CNPT).                                            DMN4162
 C8812B. SUBTRACT 1 FROM CNPT.                                          DMN4163
      IF CN (CNPT) = ' ' GO TO C8812B.                                  DMN4164
      IF CN (CNPT) = ',' MOVE ' ' TO CN (CNPT).                         DMN4165
      MOVE CNCN TO CARD-AREA.                                           DMN4166
      PERFORM WIND-UP.                                                  DMN4167
      GO TO C8812.                                                      DMN4168
 C8812A. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN4169
      MOVE '      CALL EXIT$        ' TO CARD-AREA.                     DMN4170
      PERFORM WIND-UP.                                                  DMN4171
      MOVE ' 4208 FORMAT(33H  ACHIEVED-WANTED VALUES FOR RUN ,I4,7H     DMN4172
-' FOLLOW)$        ' TO CARD-AREA.                                      DMN4173
      PERFORM WIND-UP.                                                  DMN4174
      MOVE 1 TO PNU.                                                    DMN4175
      MOVE '04205' TO DSN.                                              DMN4176
 CDZ2. MOVE BCD-OUT-CODE TO N.                                          DMN4177
      PERFORM UNPACK.                                                   DMN4178
      IF PNU1 = 1 GO TO CDZ1.                                           DMN4179
      MOVE '04208' TO AL5.                                              DMN4180
      MOVE SPACES TO CNCN.                                              DMN4181
      PERFORM MVOUSTM.                                                  DMN4182
      MOVE 'N' TO CN (30).                                              DMN4183
      MOVE 'I' TO CN (31).                                              DMN4184
      MOVE '$' TO CN (32).                                              DMN4185
      MOVE CNCN TO CARD-AREA.                                           DMN4186
      PERFORM WIND-UP.                                                  DMN4187
      GO TO CDZ2.                                                       DMN4188
 CDZ1. MOVE ZERO TO ZORRO, NOTE NO-OP.                                  DMN4189
      MOVE 0 TO PTM.                                                    DMN4190
      MOVE 0 TO NM5.                                                    DMN4191
 CDZ3. ADD 1 TO PTM.                                                    DMN4192
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           MOVE ',' TO TM (PTM).                                        DMN4193
           ADD 1 TO PTM.                                                DMN4194
           MOVE 'O' TO TM (PTM).                                        DMN4195
           ADD 1 TO PTM.                                                DMN4196
           MOVE 'N' TO TM (PTM).                                        DMN4197
           ADD 1 TO PTM.                                                DMN4198
           MOVE '(' TO TM (PTM).                                        DMN4199
           ADD 1 TO NM5.                                                DMN4200
           MOVE NM5 TO AL5.                                             DMN4201
           ADD 1 TO PTM.                                                DMN4202
           MOVE A5 (3) TO TM (PTM).                                     DMN4203
           ADD 1 TO PTM.                                                DMN4204
           MOVE A5 (4) TO TM (PTM).                                     DMN4205
           ADD 1 TO PTM.                                                DMN4206
           MOVE A5 (5) TO TM (PTM).                                     DMN4207
           ADD 1 TO PTM.                                                DMN4208
           MOVE ')' TO TM (PTM).                                        DMN4209
           IF NM5 NOT = BCC GO TO CDZ3.                                 DMN4210
           ADD 1 TO PTM.                                                DMN4211
           MOVE '$' TO TM (PTM).                                        DMN4212
           MOVE 0 TO GSNU1.                                             DMN4213
           MOVE 0 TO ADR.                                               DMN4214
           ALTER GS TO PROCEED TO GSL.                                  DMN4215
           MOVE 1 TO PTM.                                               DMN4216
           PERFORM GET-SYMBOL.                                          DMN4217
           PERFORM DUST-ALL.                                            DMN4218
           IF TOL-D = 0 AND ITE-D = 0 GO TO CWG1.                       DMN4219
           GO TO CWG2.                                                  DMN4220
       CWG1. MOVE 1 TO ITE-D.                                           DMN4221
           MOVE ITERATE-CODE TO N.                                      DMN4222
           MOVE 'I$                        ' TO INTERMEDIATE.           DMN4223
           PERFORM PUT-AWAY.                                            DMN4224
       CWG2. IF TOL-D = 0 GO TO CWG3.                                   DMN4225
           MOVE '00000' TO DSN.                                         DMN4226
           MOVE 1 TO PNU.                                               DMN4227
       CWG4. MOVE '      IF((                ' TO CARD-AREA.           DMN4228
           MOVE TOLERANCE-CODE TO N.                                    DMN4229
           PERFORM UNPACK.                                              DMN4230
           IF PNU1 = 1 GO TO CWG5.                                      DMN4231
           MOVE 5 TO PTR.                                               DMN4232
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      MOVE 10 TO CAPT.                                                  DMN4233
 CWG6. ADD 1 TO PTR.                                                    DMN4234
      ADD 1 TO CAPT.                                                    DMN4235
      MOVE TR (PTR) TO CA (CAPT).                                       DMN4236
      IF TR (PTR) NOT = '$' GO TO CWG6.                                 DMN4237
      SUBTRACT 1 FROM CAPT.                                             DMN4238
      MOVE ')**2-ON(00000)**2)4191,00000,00000$                ' TO     DMN4239
           CNCN.                                                        DMN4240
      MOVE TR (1) TO CN (09).                                           DMN4241
      MOVE TR (2) TO CN (10).                                           DMN4242
      MOVE TR (3) TO CN (11).                                           DMN4243
      MOVE TR (4) TO CN (12).                                           DMN4244
      MOVE TR (5) TO CN (13).                                           DMN4245
      ADD 1 TO AVAILABLE-SNM.                                           DMN4246
      MOVE AVAILABLE-SNM TO AL5.                                        DMN4247
      MOVE A5 (1) TO CN (24), CN (30).                                  DMN4248
      MOVE A5 (2) TO CN (25), CN (31).                                  DMN4249
      MOVE A5 (3) TO CN (26), CN (32).                                  DMN4250
      MOVE A5 (4) TO CN (27), CN (33).                                  DMN4251
      MOVE A5 (5) TO CN (28), CN (34).                                  DMN4252
      MOVE 0 TO CNPT.                                                   DMN4253
 CWG7. ADD 1 TO CAPT.                                                   DMN4254
      ADD 1 TO CNPT.                                                    DMN4255
      MOVE CN (CNPT) TO CA (CAPT).                                      DMN4256
      IF CN (CNPT) NOT = '$' GO TO CWG7.                                DMN4257
      PERFORM WIND-UP.                                                  DMN4258
      MOVE AVAILABLE-SNM TO DSN.                                        DMN4259
      GO TO CWG4.                                                       DMN4260
 CWG5. MOVE '      GO TO 4193$        ' TO CARD-AREA.                  DMN4261
      PERFORM WIND-UP.                                                  DMN4262
 CWG3. IF ITE-D = 1 GO TO CWG31.                                        DMN4263
      MOVE ' 4191 CONTINUE$           ' TO CARD-AREA.                  DMN4264
      GO TO CWG32.                                                      DMN4265
 CWG31. MOVE ' 4191 IF(NI-            ' TO CARD-AREA.                  DMN4266
      MOVE 1 TO PNU.                                                    DMN4267
      MOVE ITERATE-CODE TO N.                                           DMN4268
      PERFORM UNPACK.                                                   DMN4269
      MOVE 0 TO PTR.                                                    DMN4270
      MOVE 12 TO CAPT.                                                  DMN4271
 CWG311. ADD 1 TO PTR.                                                  DMN4272
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      MOVE TR (PTR) TO A.                                              DMN4273
      IF A = '$' GO TO CWG312.                                         DMN4274
      ADD 1 TO CAPT.                                                   DMN4275
      MOVE A TO CA (CAPT).                                             DMN4276
      GO TO CWG311.                                                    DMN4277
CWG312. MOVE ')4250,4192,4192$          ' TO CNCN.                     DMN4278
      MOVE 0 TO CNPT.                                                  DMN4279
CWG313. ADD 1 TO CAPT.                                                 DMN4280
      ADD 1 TO CNPT.                                                   DMN4281
      MOVE CN (CNPT) TO CA (CAPT).                                     DMN4282
      IF CN (CNPT) NOT = '$' GO TO CWG313.                             DMN4283
CWG32. PERFORM WIND-UP.                                                DMN4284
      MOVE ' 4250 DO 4241 NK = 1,00000$                          ' TO  DMN4285
           CARD-AREA.                                                  DMN4286
      MOVE BCC TO AL5.                                                 DMN4287
      MOVE A5 (1) TO CA (22).                                          DMN4288
      MOVE A5 (2) TO CA (23).                                          DMN4289
      MOVE A5 (3) TO CA (24).                                          DMN4290
      MOVE A5 (4) TO CA (25).                                          DMN4291
      MOVE A5 (5) TO CA (26).                                          DMN4292
      PERFORM WIND-UP.                                                 DMN4293
      MOVE ' 4241 SIDW(NK,00000)=DN(NK)$                         ' TO  DMN4294
           CARD-AREA.                                                  DMN4295
      COMPUTE NM5 = BCC + 1.                                           DMN4296
      MOVE NM5 TO AL5.                                                 DMN4297
      MOVE A5 (1) TO CA (15).                                          DMN4298
      MOVE A5 (2) TO CA (16).                                          DMN4299
      MOVE A5 (3) TO CA (17).                                          DMN4300
      MOVE A5 (4) TO CA (18).                                          DMN4301
      MOVE A5 (5) TO CA (19).                                          DMN4302
      PERFORM WIND-UP.                                                 DMN4303
      MOVE '      GO TO 4180$         ' TO CARD-AREA.                  DMN4304
      PERFORM WIND-UP.                                                 DMN4305
      IF ITE-D = 0 GO TO RAC1.                                         DMN4306
      MOVE ' 4199 FORMAT(19H  ITERATION STOPPED)$                ' TO  DMN4307
           CARD-AREA.                                                  DMN4308
      PERFORM WIND-UP.                                                 DMN4309
      MOVE '04192' TO DSN.                                             DMN4310
      MOVE 1 TO PNU.                                                   DMN4311
RAC2. MOVE BCD-OUT-CODE TO N.                                          DMN4312
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      PERFORM UNPACK.                                                    DMN4313
      IF PNU1 = 1 GO TO RAC1.                                            DMN4314
      MOVE '04199' TO AL5.                                               DMN4315
      PERFORM MVOUSTM.                                                   DMN4316
      ADD 1 TO CNPT.                                                     DMN4317
      MOVE '$' TO CN (CNPT).                                             DMN4318
 RAC3. SUBTRACT 1 FROM CNPT.                                             DMN4319
      IF CN (CNPT) = ' ' GO TO RAC3.                                     DMN4320
      IF CN (CNPT) = ',' MOVE ' ' TO CN (CNPT).                          DMN4321
      MOVE CNCN TO CARD-AREA.                                            DMN4322
      PERFORM WIND-UP.                                                   DMN4323
      GO TO RAC2.                                                        DMN4324
 RAC1. IF TOL-D = 1 AND ITE-D = 1 GO TO RAC4.                            DMN4325
      GO TO RAC5.                                                        DMN4326
 RAC4. MOVE '      GO TO 4220$        ' TO CARD-AREA.                   DMN4327
      PERFORM WIND-UP.                                                   DMN4328
 RAC5. IF TOL-D = 0 GO TO RAC6.                                          DMN4329
      MOVE ' 4194 FORMAT(21H  ITERATION CONVERGED)$        ' TO          DMN4330
           CARD-AREA.                                                    DMN4331
      PERFORM WIND-UP.                                                   DMN4332
      MOVE '04193' TO DSN.                                               DMN4333
      MOVE 1 TO PNU.                                                     DMN4334
 CRA2. MOVE BCD-OUT-CODE TO N.                                           DMN4335
      PERFORM UNPACK.                                                    DMN4336
      IF PNU1 = 1 GO TO CRA1.                                            DMN4337
      MOVE '04194' TO AL5.                                               DMN4338
      PERFORM MVOUSTM.                                                   DMN4339
      ADD 1 TO CNPT.                                                     DMN4340
      MOVE '$' TO CN (CNPT).                                             DMN4341
 CRA3. SUBTRACT 1 FROM CNPT.                                             DMN4342
      IF CN (CNPT) = ' ' GO TO CRA3.                                     DMN4343
      IF CN (CNPT) = ',' MOVE ' ' TO CN (CNPT).                          DMN4344
      MOVE CNCN TO CARD-AREA.                                            DMN4345
      PERFORM WIND-UP.                                                   DMN4346
      GO TO CRA2.                                                        DMN4347
 CRA1. MOVE ZERO TO ZORRO, NOTE NO-OP.                                   DMN4348
 RAC6. MOVE ZERO TO ZORRO, NOTE NO-OP.                                   DMN4349
      MOVE ' 4220 NH=NH-1$           ' TO CARD-AREA.                    DMN4350
      PERFORM WIND-UP.                                                   DMN4351
      MOVE '      IF(NH)4222,4221,4221$                    ' TO          DMN4352
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               CARD-AREA.                                             DMN4353
           PERFORM WIND-UP.                                           DMN4354
           MOVE '04221' TO DSN.                                       DMN4355
           MOVE FREAD TO CARD-AREA.                                   DMN4356
           MOVE 'NV,(DY(NK,N2),DY(NK,NF2),NK=1,NDE)$             ' TO DMN4357
               CNCN.                                                  DMN4358
           MOVE 30 TO CNPT.                                           DMN4359
       ZACCC1. ADD 1 TO CNPT.                                         DMN4360
           IF CN (CNPT) NOT = '$' GO TO ZACCC1.                       DMN4361
           MOVE 1 TO PNU.                                             DMN4362
       ZACCC2. MOVE SYMBOL-TABLE-CODE TO N.                           DMN4363
           PERFORM UNPACK.                                            DMN4364
           IF PNU1 = 1 GO TO ZACCC3.                                  DMN4365
           MOVE TEMPORARY TO TABLE-AREA.                              DMN4366
           IF TBTYPE NOT = 3 GO TO ZACCC2.                            DMN4367
           MOVE ',' TO CN (CNPT).                                     DMN4368
           MOVE 0 TO PTM.                                             DMN4369
       ZACCC4. ADD 1 TO PTM.                                          DMN4370
           ADD 1 TO CNPT.                                             DMN4371
           IF PTM = 10 GO TO ZACCC2.                                  DMN4372
           MOVE TBL1 (PTM) TO CN (CNPT).                              DMN4373
           GO TO ZACCC4.                                              DMN4374
       ZACCC3. MOVE '$' TO CN (CNPT).                                 DMN4375
           MOVE 0 TO CNPT.                                            DMN4376
           MOVE 39 TO CAPT.                                           DMN4377
       JDJ1. ADD 1 TO CNPT.                                           DMN4378
           ADD 1 TO CAPT.                                             DMN4379
           MOVE CN (CNPT) TO CA (CAPT).                               DMN4380
           IF CN (CNPT) NOT = '$' GO TO JDJ1.                         DMN4381
           PERFORM WIND-UP.                                           DMN4382
           IF FRED = 1 AND FDX = 1 GO TO JDJ2.                        DMN4383
           GO TO JDJ3.                                                DMN4384
       JDJ2. MOVE '       IF(  000  )  5,4  0,4195$              ' TO DMN4385
               CARD-AREA.                                             DMN4386
           COMPUTE NM5 = COND-NM + 1.                                 DMN4387
           MOVE NM5 TO AL5.                                           DMN4388
           MOVE A5 (1) TO CA (13).                                    DMN4389
           MOVE A5 (2) TO CA (14).                                    DMN4390
           MOVE A5 (3) TO CA (15).                                    DMN4391
           MOVE A5 (4) TO CA (16).                                    DMN4392
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     MOVE A5 (5) TO CA (17).                                          DMN4393
     PERFORM WIND-UP.                                                 DMN4394
JDJ3. MOVE ZERO TO ZORRO, NOTE NO-OP.                                 DMN4395
     MOVE ' 4195 IF(NV)4170,4170,4175$                    ' TO       DMN4396
            CARD-AREA.                                                DMN4397
     PERFORM WIND-UP.                                                 DMN4398
     MOVE ' 4173 IF(NJ-1)4174,4240,4174$                  ' TO       DMN4399
            CARD-AREA.                                                DMN4400
     PERFORM WIND-UP.                                                 DMN4401
     MOVE ' 4240 NH=NH+1$           ' TO CARD-AREA.                   DMN4402
     PERFORM WIND-UP.                                                 DMN4403
     MOVE FWRITE TO CARD-AREA.                                        DMN4404
     MOVE 'NV,(OY(NK,N2),OY(NK,NF2),NK=1,NDE)$            ' TO       DMN4405
            CNCN.                                                     DMN4406
     MOVE 30 TO CNPT.                                                 DMN4407
RACCC1. ADD 1 TO CNPT.                                                DMN4408
     IF CN (CNPT) NOT = '$' GO TO RACCC1.                             DMN4409
     MOVE 1 TO PNU.                                                   DMN4410
RACCC2. MOVE SYMBOL-TABLE-CODE TO N.                                  DMN4411
     PERFORM UNPACK.                                                  DMN4412
     IF PNU1 = 1 GO TO RACCC3.                                        DMN4413
     MOVE TEMPORARY TO TABLE-AREA.                                    DMN4414
     IF TBTYPE NOT = 'X' GO TO RACCC2.                                DMN4415
     MOVE ',' TO CN (CNPT).                                           DMN4416
     MOVE 0 TO PTM.                                                   DMN4417
RACCC4. ADD 1 TO PTM.                                                 DMN4418
     ADD 1 TO CNPT.                                                   DMN4419
     IF PTM = 10 GO TO RACCC2.                                        DMN4420
     MOVE TBL1 (PTM) TO CN (CNPT).                                    DMN4421
     GO TO RACCC4.                                                    DMN4422
RACCC3. MOVE '$' TO CN (CNPT).                                        DMN4423
     MOVE 0 TO CNPT.                                                  DMN4424
     MOVE 39 TO CAPT.                                                 DMN4425
JDJ4. ADD 1 TO CNPT.                                                  DMN4426
     ADD 1 TO CAPT.                                                   DMN4427
     MOVE CN (CNPT) TO CA (CAPT).                                     DMN4428
     IF CN (CNPT) NOT = '$' GO TO JDJ4.                               DMN4429
     PERFORM WIND-UP.                                                 DMN4430
     MOVE ' 4174 IF(NV)4150,4150,4176$                    ' TO       DMN4431
            CARD-AREA.                                                DMN4432
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      PERFORM WIND-UP.                                                  DMN4433
      MOVE CGT4-CODE TO N.                                              DMN4434
      MOVE 1 TO PNU.                                                    DMN4435
      PERFORM UNPACK.                                                   DMN4436
      MOVE TEMPORARY TO INTERMEDIATE.                                   DMN4437
      MOVE 'NV    ' TO REG9.                                            DMN4438
      MOVE '04176' TO DSN.                                              DMN4439
      PERFORM GENERATE-CGT.                                             DMN4440
      MOVE ' 4180 CONTINUE$          ' TO CARD-AREA.                    DMN4441
      PERFORM WIND-UP.                                                  DMN4442
      MOVE ' 4222 CONTINUE$          ' TO CARD-AREA.                    DMN4443
      PERFORM WIND-UP.                                                  DMN4444
 SKIP-ITERATIONS. MOVE ZERO TO ZORRO, NOTE NO-OP.                       DMN4445
      MOVE 1 TO PNU.                                                    DMN4446
      MOVE POST-CARD-CODE TO N.                                         DMN4447
 ZZZ9. PERFORM UNPACK.                                                  DMN4448
      MOVE TEMPORARY TO CARD-AREA.                                      DMN4449
      IF CA (1) = ')' GO TO ZZZ33.                                      DMN4450
      IF CA (1) = ',' MOVE '$' TO CA (1).                               DMN4451
      PERFORM WIND-UP.                                                  DMN4452
      GO TO ZZZ9.                                                       DMN4453
 ZZZ33. PERFORM UNPACK.                                                 DMN4454
      MOVE 1 TO DATAD.                                                  DMN4455
      IF PNU1 = 1 GO TO ZZZ10.                                          DMN4456
      IF TR (1) = ',' MOVE '$' TO TR (1).                               DMN4457
      MOVE TEMPORARY TO OUTCARD.                                        DMN4458
      PERFORM WRITE-OUT.                                                DMN4459
      GO TO ZZZ33.                                                      DMN4460
 ZZZ10. MOVE ZERO TO ZORRO, NOTE NO-OP.                                 DMN4461
      MOVE '$RESTORE                 ' TO FORTCARD.                     DMN4462
      IF TAPE-D = 1 WRITE FORT.                                         DMN4463
      PERFORM READ-IN.                                                  DMN4464
      MOVE '$SWITCH        S.SIN1,S.SU04                    ' TO        DMN4465
           INCARD.                                                      DMN4466
      IF TAPE-D = 0 MOVE '$IBSYS' TO INCARD.                            DMN4467
      CLOSE INFILE, OUTFILE.                                            DMN4468
      CLOSE PUNCHFILE.                                                  DMN4469
      CLOSE FORTFILE.                                                   DMN4470
      STOP RUN.                                                         DMN4471
 WIND-UP SECTION.                                                       DMN4472
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 WU. MOVE SPACES TO OUTCARD.                                        DMN4473
     MOVE 0 TO P1.                                                  DMN4474
     IF DSN = '00000' GO TO WU1.                                    DMN4475
     MOVE CA (1) TO CAL (1).                                        DMN4476
     MOVE CA (2) TO CAL (2).                                        DMN4477
     MOVE CA (3) TO CAL (3).                                        DMN4478
     MOVE CA (4) TO CAL (4).                                        DMN4479
     MOVE CA (5) TO CAL (5).                                        DMN4480
     IF CALOOK = '     ' GO TO WU2.                                 DMN4481
     MOVE '      CONTINUE          ' TO OUTCARD.                    DMN4482
     MOVE DS (1) TO DC (1).                                         DMN4483
     MOVE DS (2) TO DC (2).                                         DMN4484
     MOVE DS (3) TO DC (3).                                         DMN4485
     MOVE DS (4) TO DC (4).                                         DMN4486
     MOVE DS (5) TO DC (5).                                         DMN4487
     MOVE '00000' TO DSN.                                           DMN4488
     PERFORM WRITE-OUT.                                             DMN4489
     MOVE SPACES TO OUTCARD.                                        DMN4490
     GO TO WU1.                                                     DMN4491
WU2. MOVE DS (1) TO DC (1).                                         DMN4492
     MOVE DS (2) TO DC (2).                                         DMN4493
     MOVE DS (3) TO DC (3).                                         DMN4494
     MOVE DS (4) TO DC (4).                                         DMN4495
     MOVE DS (5) TO DC (5).                                         DMN4496
     MOVE '00000' TO DSN.                                           DMN4497
     GO TO WU5.                                                     DMN4498
WU1. MOVE CA (1) TO DC (1).                                         DMN4499
     MOVE CA (2) TO DC (2).                                         DMN4500
     MOVE CA (3) TO DC (3).                                         DMN4501
     MOVE CA (4) TO DC (4).                                         DMN4502
     MOVE CA (5) TO DC (5).                                         DMN4503
     MOVE CA (6) TO DC (6).                                         DMN4504
WU5. MOVE 6 TO CAPT.                                                DMN4505
WU6. MOVE 6 TO DCPT.                                                DMN4506
WU7. ADD 1 TO DCPT.                                                 DMN4507
     IF DCPT = 73 GO TO WU8.                                        DMN4508
     ADD 1 TO CAPT.                                                 DMN4509
     IF CA (CAPT) = '$' GO TO WU9.                                  DMN4510
     MOVE CA (CAPT) TO DC (DCPT).                                   DMN4511
     GO TO WU7.                                                     DMN4512
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WU8. IF CA (73) = '$' GO TO WU9.                                    DMN4513
     PERFORM WRITE-OUT.                                             DMN4514
     MOVE SPACES TO OUTCARD.                                        DMN4515
     ADD 1 TO P1.                                                   DMN4516
     MOVE P1 TO DC (6).                                             DMN4517
     GO TO WU6.                                                     DMN4518
WU9. PERFORM WRITE-OUT.                                             DMN4519
     NOTE FINISH WIND-UP.                                           DMN4520
R4LEFT SECTION.                                                     DMN4521
R4L. MOVE R4 (2) TO R4 (1).                                         DMN4522
     MOVE R4 (3) TO R4 (2).                                         DMN4523
     MOVE R4 (4) TO R4 (3).                                         DMN4524
     MOVE SPACE TO R4 (4).                                          DMN4525
     NOTE FINISH R4LEFT.                                            DMN4526
R9LEFT-JUSTIFY SECTION.                                             DMN4527
R9LJJJ. IF REG9 = '         ' GO TO UNUSUAL-END.                    DMN4528
R9LJ1. IF R9 (1) NOT = ' ' GO TO R9LJ2.                             DMN4529
     PERFORM R9LEFT.                                                DMN4530
     GO TO R9LJ1.                                                   DMN4531
R9LJ2. EXIT.                                                        DMN4532
     NOTE FINISH R9LEFT-JUSTIFY.                                    DMN4533
R9LEFT SECTION.                                                     DMN4534
R9L. MOVE R9 (2) TO R9 (1).                                         DMN4535
     MOVE R9 (3) TO R9 (2).                                         DMN4536
     MOVE R9 (4) TO R9 (3).                                         DMN4537
     MOVE R9 (5) TO R9 (4).                                         DMN4538
     MOVE R9 (6) TO R9 (5).                                         DMN4539
     MOVE R9 (7) TO R9 (6).                                         DMN4540
     MOVE R9 (8) TO R9 (7).                                         DMN4541
     MOVE R9 (9) TO R9 (8).                                         DMN4542
     MOVE SPACE TO R9 (9).                                          DMN4543
     NOTE FINISH R9LEFT.                                            DMN4544
FIXED-POINT-TEST SECTION.                                           DMN4545
FPT. MOVE 0 TO FXD.                                                 DMN4546
     IF A IS EQUAL TO 'I' MOVE 1 TO FXD.                            DMN4547
     IF A IS EQUAL TO 'J' MOVE 1 TO FXD.                            DMN4548
     IF A IS EQUAL TO 'K' MOVE 1 TO FXD.                            DMN4549
     IF A IS EQUAL TO 'L' MOVE 1 TO FXD.                            DMN4550
     IF A IS EQUAL TO 'M' MOVE 1 TO FXD.                            DMN4551
     IF A IS EQUAL TO 'N' MOVE 1 TO FXD.                            DMN4552
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     NOTE FINISH FIXED-POINT-TEST.                              DMN4553
 TBL1LEFT SECTION.                                              DMN4554
 TLL. MOVE TBL1 (2) TO TBL1 (1).                                DMN4555
     MOVE TBL1 (3) TO TBL1 (2).                                 DMN4556
     MOVE TBL1 (4) TO TBL1 (3).                                 DMN4557
     MOVE TBL1 (5) TO TBL1 (4).                                 DMN4558
     MOVE TBL1 (6) TO TBL1 (5).                                 DMN4559
     MOVE TBL1 (7) TO TBL1 (6).                                 DMN4560
     MOVE TBL1 (8) TO TBL1 (7).                                 DMN4561
     MOVE TBL1 (9) TO TBL1 (8).                                 DMN4562
     MOVE SPACE TO TBL1 (9).                                    DMN4563
     NOTE FINISH TBL1LEFT.                                      DMN4564
 WRITE-OUT SECTION.                                             DMN4565
 WOR1. IF DELAY-D = 0 GO TO WOR2.                               DMN4566
     IF DELAY-D1 = 1 GO TO WOR3.                                DMN4567
     MOVE OUTCARD TO OUTCARD1.                                  DMN4568
     MOVE 1 TO DELAY-D1.                                        DMN4569
     GO TO WOR4.                                                DMN4570
 WOR3. MOVE OUTCARD1 TO OUTCARD2.                               DMN4571
     MOVE OUTCARD TO OUTCARD1.                                  DMN4572
     MOVE OUTCARD2 TO OUTCARD.                                  DMN4573
 WOR2. PERFORM WRITE-OUT-1.                                     DMN4574
 WOR4. EXIT.                                                    DMN4575
     NOTE FINISH WRITE-OUT.                                     DMN4576
 WRITE-OUT-1 SECTION.                                           DMN4577
 WRO11. IF DATAD = 1 GO TO WO.                                  DMN4578
     IF DC (1) = '$' GO TO WO.                                  DMN4579
 WRO. ADD 1 TO SENM.                                            DMN4580
     MOVE SENM TO SENMA.                                        DMN4581
     MOVE SENMA1 (1) TO DC (76).                                DMN4582
     MOVE SENMA1 (2) TO DC (77).                                DMN4583
     MOVE SENMA1 (3) TO DC (78).                                DMN4584
     MOVE SENMA1 (4) TO DC (79).                                DMN4585
     MOVE SENMA1 (5) TO DC (80).                                DMN4586
 WO. IF LIST-D = 1 WRITE OUT.                                   DMN4587
     MOVE OUTCARD TO FORTCARD.                                  DMN4588
     IF TAPE-D = 1 WRITE FORT.                                  DMN4589
     MOVE OUTCARD TO LUNCH-CARD.                                DMN4590
     IF DECK-D = 1 WRITE LUNCH.                                 DMN4591
     NOTE FINISH WRITE-OUT-1.                                   DMN4592
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DIM-ERAS SECTION.                                                       DMN4593
DIM-ERA2. MOVE SPACES TO OUT.                                           DMN4594
    MOVE 'DIMENSION TOO BIG FOR    ' TO OUTCARD.                        DMN4595
    GO TO V1.                                                           DMN4596
DIM-ERA. MOVE SPACES TO OUT.                                            DMN4597
    MOVE 'NO DIMENSION CARD FOR    ' TO OUTCARD.                        DMN4598
V1. MOVE R9 (1) TO DC (23).                                             DMN4599
    MOVE R9 (2) TO DC (24).                                             DMN4600
    MOVE R9 (3) TO DC (25).                                             DMN4601
    MOVE R9 (4) TO DC (26).                                             DMN4602
    MOVE R9 (5) TO DC (27).                                             DMN4603
    MOVE R9 (6) TO DC (28).                                             DMN4604
    MOVE R9 (7) TO DC (29).                                             DMN4605
    MOVE R9 (8) TO DC (30).                                             DMN4606
    MOVE R9 (9) TO DC (31).                                             DMN4607
    PERFORM WRITE-OUT.                                                  DMN4608
    GO TO UNUSUAL-END.                                                  DMN4609
UNUSUAL-END SECTION.                                                    DMN4610
UE. DISPLAY 'UNUSUAL END. ' .                                           DMN4611
    STOP RUN.                                                           DMN4612
    NOTE FINISH UNUSUAL-END.                                            DMN4613
AL5-NM5 SECTION.                                                        DMN4614
AM. MOVE A5 (1) TO AL, PERFORM AL-NM, MOVE NM TO P1.                    DMN4615
    MOVE A5 (2) TO AL, PERFORM AL-NM, MOVE NM TO P2.                    DMN4616
    MOVE A5 (3) TO AL, PERFORM AL-NM, MOVE NM TO P3.                    DMN4617
    MOVE A5 (4) TO AL, PERFORM AL-NM, MOVE NM TO P4.                    DMN4618
    MOVE A5 (5) TO AL, PERFORM AL-NM, MOVE NM TO P5.                    DMN4619
    COMPUTE NM5 = 10000 * P1 + 1000 * P2 + 100 * P3 + 10 * P4           DMN4620
                + P5.                                                   DMN4621
    NOTE FINISH AL5-NM5.                                                DMN4622
AL-NM SECTION.                                                          DMN4623
AN1. IF AL NOT = '0' GO TO AN2.                                         DMN4624
    MOVE 0 TO NM.                                                       DMN4625
    GO TO AN99.                                                         DMN4626
AN2. IF AL NOT = '1' GO TO AN3.                                         DMN4627
    MOVE 1 TO NM.                                                       DMN4628
    GO TO AN99.                                                         DMN4629
AN3. IF AL NOT = '2' GO TO AN4.                                         DMN4630
    MOVE 2 TO NM.                                                       DMN4631
    GO TO AN99.                                                         DMN4632
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AN4. IF AL NOT = '3' GO TO AN5.                                          DMN4633
     MOVE 3 TO NM.                                                       DMN4634
     GO TO AN99.                                                         DMN4635
AN5. IF AL NOT = '4' GO TO AN6.                                          DMN4636
     MOVE 4 TO NM.                                                       DMN4637
     GO TO AN99.                                                         DMN4638
AN6. IF AL NOT = '5' GO TO AN7.                                          DMN4639
     MOVE 5 TO NM.                                                       DMN4640
     GO TO AN99.                                                         DMN4641
AN7. IF AL NOT = '6' GO TO AN8.                                          DMN4642
     MOVE 6 TO NM.                                                       DMN4643
     GO TO AN99.                                                         DMN4644
AN8. IF AL NOT = '7' GO TO AN9.                                          DMN4645
     MOVE 7 TO NM.                                                       DMN4646
     GO TO AN99.                                                         DMN4647
AN9. IF AL NOT = '8' GO TO AN10.                                         DMN4648
     MOVE 8 TO NM.                                                       DMN4649
     GO TO AN99.                                                         DMN4650
AN10. IF AL NOT = '9' GO TO AN11.                                        DMN4651
     MOVE 9 TO NM.                                                       DMN4652
     GO TO AN99.                                                         DMN4653
AN11. DISPLAY ' ALPHA TO NUMBER MOVE ATTEMPTED  ', AL.                   DMN4654
     GO TO UNUSUAL-END.                                                  DMN4655
AN99. EXIT.                                                              DMN4656
     NOTE FINISH AL-NM.                                                  DMN4657
NTEST SECTION.                                                           DMN4658
NS. MOVE 0 TO NT.                                                        DMN4659
     IF B = '0' GO TO NS1.                                               DMN4660
     IF B = '1' GO TO NS1.                                               DMN4661
     IF B = '2' GO TO NS1.                                               DMN4662
     IF B = '3' GO TO NS1.                                               DMN4663
     IF B = '4' GO TO NS1.                                               DMN4664
     IF B = '5' GO TO NS1.                                               DMN4665
     IF B = '6' GO TO NS1.                                               DMN4666
     IF B = '7' GO TO NS1.                                               DMN4667
     IF B = '8' GO TO NS1.                                               DMN4668
     IF B = '9' GO TO NS1.                                               DMN4669
     GO TO NS2.                                                          DMN4670
NS1. MOVE 1 TO NT.                                                       DMN4671
NS2. EXIT.                                                               DMN4672
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    NOTE FINISH NTEST.                                          DMN4673
ATEST SECTION.                                                  DMN4674
AT1. MOVE 0 TO NT.                                              DMN4675
    IF B = 'A' GO TO AT2.                                       DMN4676
    IF B = 'B' GO TO AT2.                                       DMN4677
    IF B = 'C' GO TO AT2.                                       DMN4678
    IF B = 'D' GO TO AT2.                                       DMN4679
    IF B = 'E' GO TO AT2.                                       DMN4680
    IF B = 'F' GO TO AT2.                                       DMN4681
    IF B = 'G' GO TO AT2.                                       DMN4682
    IF B = 'H' GO TO AT2.                                       DMN4683
    IF B = 'I' GO TO AT2.                                       DMN4684
    IF B = 'J' GO TO AT2.                                       DMN4685
    IF B = 'K' GO TO AT2.                                       DMN4686
    IF B = 'L' GO TO AT2.                                       DMN4687
    IF B = 'M' GO TO AT2.                                       DMN4688
    IF B = 'N' GO TO AT2.                                       DMN4689
    IF B = 'O' GO TO AT2.                                       DMN4690
    IF B = 'P' GO TO AT2.                                       DMN4691
    IF B = 'Q' GO TO AT2.                                       DMN4692
    IF B = 'R' GO TO AT2.                                       DMN4693
    IF B = 'S' GO TO AT2.                                       DMN4694
    IF B = 'T' GO TO AT2.                                       DMN4695
    IF B = 'U' GO TO AT2.                                       DMN4696
    IF B = 'V' GO TO AT2.                                       DMN4697
    IF B = 'W' GO TO AT2.                                       DMN4698
    IF B = 'X' GO TO AT2.                                       DMN4699
    IF B = 'Y' GO TO AT2.                                       DMN4700
    IF B = 'Z' GO TO AT2.                                       DMN4701
    GO TO AT3.                                                  DMN4702
AT2. MOVE 2 TO NT.                                              DMN4703
AT3. EXIT.                                                      DMN4704
    NOTE FINISH ATEST.                                          DMN4705
READ-IN SECTION.                                                DMN4706
RI. READ INFILE, AT END GO TO RIXX.                             DMN4707
RIXX. EXIT.                                                     DMN4708
    NOTE FINISH READ-IN.                                        DMN4709
PUT-AWAY SECTION.                                               DMN4710
PA. IF STA (N) NOT = 0 GO TO B1.                                DMN4711
    ADD 1 TO PTE.                                               DMN4712
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           MOVE PTE TO STA (N).                                                  DMN4713
           GO TO PA1.                                                            DMN4714
       PA3. MOVE 'C STORE OVERFLOW' TO OUTCARD.                                  DMN4715
           PERFORM WRITE-OUT.                                                    DMN4716
           GO TO UNUSUAL-END.                                                    DMN4717
       P1. ADD 1 TO PTE.                                                         DMN4718
           MOVE PTE TO PET.                                                      DMN4719
           MOVE PT (N) TO D5.                                                    DMN4720
           MOVE PTS (1) TO ST (D5).                                              DMN4721
           ADD 1 TO D5.                                                          DMN4722
           MOVE PTS (2) TO ST (D5).                                              DMN4723
           ADD 1 TO D5.                                                          DMN4724
           MOVE PTS (3) TO ST (D5).                                              DMN4725
           ADD 1 TO D5.                                                          DMN4726
           MOVE PTS (4) TO ST (D5).                                              DMN4727
           ADD 1 TO D5.                                                          DMN4728
           MOVE PTS (5) TO ST (D5).                                              DMN4729
       PA1. MOVE PTE TO PT (N).                                                  DMN4730
           MOVE 'E' TO ST (PTE).                                                 DMN4731
           ADD 4 TO PTE.                                                         DMN4732
       P.  MOVE 0 TO PTM.                                                        DMN4733
       Q1. ADD 1 TO PTE.                                                         DMN4734
           IF PTE GREATER THAN STORE-SIZE GO TO PA3.                             DMN4735
           ADD 1 TO PTM.                                                         DMN4736
           MOVE TM (PTM) TO ST (PTE).                                            DMN4737
           IF TM (PTM) NOT = '$' GO TO Q1.                                       DMN4738
           NOTE FINISH PUT-AWAY.                                                 DMN4739
       UNPACK SECTION.                                                           DMN4740
       UP. IF PNU NOT = 1 GO TO N3.                                              DMN4741
           MOVE 0 TO PNU.                                                        DMN4742
           IF STA (N) = 0 GO TO FIN.                                             DMN4743
           MOVE STA (N) TO STP (N).                                              DMN4744
           GO TO N6.                                                             DMN4745
       N3. MOVE STP (N) TO PRE.                                                  DMN4746
           IF ST (PRE) = 'E' GO TO FIN.                                          DMN4747
           MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P1.                    DMN4748
           ADD 1 TO PRE.                                                         DMN4749
           MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P2.                    DMN4750
           ADD 1 TO PRE.                                                         DMN4751
           MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P3.                    DMN4752
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    ADD 1 TO PRE.                                                    DMN4753
    MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P4.               DMN4754
    ADD 1 TO PRE.                                                    DMN4755
    MOVE ST (PRE) TO AL, PERFORM AL-NM, MOVE NM TO P5.               DMN4756
    COMPUTE STP (N) = 10000 * P1 + 1000 * P2 + 100 * P3              DMN4757
                    + 10 * P4 + P5.                                  DMN4758
N6. MOVE STP (N) TO PRE.                                             DMN4759
    ADD 4 TO PRE.                                                    DMN4760
    MOVE 0 TO PTR.                                                   DM 4761
N4. ADD 1 TO PTR.                                                    DMN4762
    ADD 1 TO PRE.                                                    DMN4763
    MOVE ST (PRE) TO TR (PTR).                                       DMN4764
    IF ST (PRE) NOT = '$' GO TO N4.                                  DMN4765
    MOVE 0 TO PNU1.                                                  DMN4766
    GO TO N5.                                                        DMN4767
FIN. MOVE 1 TO PNU1.                                                 DMN4768
N5. EXIT.                                                            DMN4769
    NOTE FINISH UNPACK.                                              DMN4770
INSERT SECTION.                                                      DMN4771
INS. SUBTRACT 1 FROM PRE.                                            D N4772
    IF PRE = 0 GO TO INS1.                                           DMN4773
    IF ST (PRE) NOT = '$  GO TO INS.                                 DMN4774
INS1. ADD 1 TO PRE                                                   DMN4775
    IF ST (PRE) NOT = 'E'  0 TO INS2.                                DMN4776
    PERFORM PUT-AWAY.                                                DMN4777
    GO TO INSX.                                                      DMN4778
INS2. ADD 1 TO PTE.                                                  DMN4779
    MOVE PTE TO PET.                                                 DMN4780
    MOVE 1 TO D5.                                                    DMN4781
INS3. MOVE ST (PRE) TO ST (PTE).                                     DMN4782
    MOVE PTS (D5) TO ST (PRE).                                       DMN4783
    IF D5 - 5 GO TO INS4.                                            DMN4784
    ADD 1 TO PTE.                                                    DMN4785
    ADD 1 TO PRE.                                                    DMN4786
    ADD 1 TO D5.                                                     DMN4787
    GO TO INS3.                                                      DMN4788
INS4. MOVE 0 TO PTM                                                  DMN4789
INS5. ADD 1 TO PTM.                                                  DMN479C
    ADD 1 TO PTE.                                                    DMN4791
    MOVE TM (PTM) TO ST (PTE).                                       DMN4792
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           IF TM (PTM) NOT = '$' GO TO INS5.                    DMN4793
       INSX. EXIT.                                              DMN4794
           NOTE FINISH INSERT.                                  DMN4795
       REPLACE SECTION.                                         DMN4796
       RP. ADD 1 TO PTR.                                        DMN4797
           ADD 1 TO PRE.                                        DMN4798
       RP1. SUBTRACT 1 FROM PTR.                                DMN4799
           SUBTRACT 1 FROM PRE.                                 DMN4800
           MOVE TR (PTR) TO ST (PRE).                           DMN4801
           IF PTR NOT = 1 GO TO RP1.                            DMN4802
           NOTE FINISH REPLACE.                                 DMN4803
       FIND-METHOD SECTION.                                     DMN4804
       LUM. MOVE METHOD-CODE TO N.                              DMN4805
           MOVE 1 TO PNU.                                       DMN4806
       PH43. PERFORM UNPACK.                                    DMN4807
           IF PNU1 = 1 GO TO FNDMETXT.                          DMN4808
           IF TR (6) NOT = 'S' GO TO PH43.                      DMN4809
           IF TR (07) NOT = R9 (1) GO TO PH43.                  DMN4810
           IF TR (08) NOT = R9 (2) GO TO PH43.                  DMN4811
           IF TR (09) NOT = R9 (3) GO TO PH43.                  DMN4812
           IF TR (10) NOT = R9 (4) GO TO PH43.                  DMN4813
           IF TR (11) NOT = R9 (5) GO TO PH43.                  DMN4814
           IF TR (12) NOT = R9 (6) GO TO PH43.                  DMN4815
           IF TR (13) NOT = R9 (7) GO TO PH43.                  DMN4816
           IF TR (14) NOT = R9 (8) GO TO PH43.                  DMN4817
           IF TR (15) NOT = R9 (9) GO TO PH43.                  DMN4818
       FNDMETXT. EXIT.                                          DMN4819
           NOTE FINISH FIND-METHOD.                             DMN4820
       LOOK-UP-METHOD SECTION.                                  DMN4821
       LUMMM. PERFORM FIND-METHOD.                              DMN4822
           IF PNU1 = 1 GO TO PH431.                             DMN4823
           MOVE TR (16) TO MTYPE.                               DMN4824
           MOVE TR (17) TO A5 (1).                              DMN4825
           MOVE TR (18) TO A5 (2).                              DMN4826
           MOVE TR (19) TO A5 (3).                              DMN4827
           MOVE TR (20) TO A5 (4).                              DMN4828
           MOVE TR (21) TO A5 (5).                              DMN4829
           PERFORM AL5-NM5.                                     DMN4830
           MOVE NM5 TO PERM-REG.                                DMN4831
           MOVE TR (22) TO A5 (1).                              DMN4832
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        MOVE TR (23) TO A5 (2).                                    DMN4833
        MOVE TR (24) TO A5 (3).                                    DMN4834
        MOVE TR (25) TO A5 (4).                                    DMN4835
        MOVE TR (26) TO A5 (5).                                    DMN4836
        PERFORM AL5-NM5.                                           DMN4837
        MOVE NM5 TO TEMP-REG.                                      DMN4838
        GO TO LUMX.                                                DMN4839
    PH431. MOVE 'RK2       ' TO REG9.                              DMN4840
        GO TO LUMMM.                                               DMN4841
    LUMX. EXIT.                                                    DMN4842
        NOTE FINISH LOOK-UP-METHOD.                                DMN4843
    OUTPUT-STATEMENTS SECTION.                                     DMN4844
    BDCAA. PERFORM START-GET-SYMBOL.                               DMN4845
        PERFORM GET-SYMBOL.                                        DMN4846
        PERFORM OUST-ALL.                                          DMN4847
        NOTE FINISH OUTPUT-STATEMENTS.                             DMN4848
    OUST-ALL SECTION.                                              DMN4849
    BDC. MOVE 1 TO PNU.                                            DMN4850
        MOVE BCD-OUT-CODE TO N.                                    DMN4851
        PERFORM UNPACK.                                            DMN4852
        ADD 1 TO AVAILABLE-SNM.                                    DMN4853
        MOVE AVAILABLE-SNM TO DSN.                                 DMN4854
        MOVE DSN TO AL5.                                           DMN4855
        MOVE SPACES TO CNCN.                                       DMN4856
        PERFORM MVOUSTM.                                           DMN4857
        MOVE 30 TO CNPT.                                           DMN4858
        MOVE '      FORMAT(1P          ' TO CARD-AREA.             DMN4859
        MOVE 15 TO CAPT.                                           DMN4860
        MOVE 0 TO FMPTR.                                           DMN4861
        PERFORM GENERATE-FORMAT.                                   DMN4862
        PERFORM WIND-UP.                                           DMN4863
        MOVE CNCN TO TEMPORARY.                                    DMN4864
        PERFORM TRANSLATE-CARD.                                    DMN4865
    BDC4. MOVE BCD-OUT-CODE TO N.                                  DMN4866
        PERFORM UNPACK.                                            DMN4867
        IF PNU1 = 1 GO TO BDC5.                                    DMN4868
        MOVE CARD-AREA TO CNCN.                                    DMN4869
        MOVE 0 TO D5.                                              DMN4870
    BDC41. ADD 1 TO D5.                                            DMN4871
        MOVE ' ' TO CN (D5).                                       DMN4872
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           IF D5 LESS THAN 29 GO TO BDC41.                                  DMN4873
           MOVE AVAILABLE-SNM TO AL5.                                       DMN4874
           PERFORM MVOUSTM.                                                 DMN4875
           MOVE CNCN TO CARD-AREA.                                          DMN4876
           PERFORM WIND-UP.                                                 DMN4877
           GO TO BDC4.                                                      DMN4878
       BDC5. IF GNFU1 NOT = 1 GO TO BDC.                                    DMN4879
       BDC5555. EXIT.                                                       DMN4880
           NOTE FINISH OUST-ALL.                                            DMN4881
       GENERATE-FORMAT SECTION.                                             DMN4882
       GNFF. MOVE 0 TO GNFU1.                                               DMN4883
       GNF. IF FMPTR + SAPT + 16 NOT LESS THAN CHPL GO TO GNF99.            DMN4884
           COMPUTE FMPTR = FMPTR + SAPT + 16.                               DMN4885
           ADD 1 TO CAPT.                                                   DMN4886
           MOVE '2' TO CA (CAPT).                                           DMN4887
           ADD 1 TO CAPT.                                                   DMN4888
           MOVE 'X' TO CA (CAPT).                                           DMN4889
           MOVE SAPT TO AL5.                                                DMN4890
           ADD 1 TO CAPT.                                                   DMN4891
           MOVE A5 (4) TO CA (CAPT).                                        DMN4892
           ADD 1 TO CAPT.                                                   DMN4893
           MOVE A5 (5) TO CA (CAPT).                                        DMN4894
           ADD 1 TO CAPT.                                                   DMN4895
           MOVE 'H' TO CA (CAPT).                                           DMN4896
           MOVE 0 TO SAPT.                                                  DMN4897
       GNF1. ADD 1 TO SAPT.                                                 DMN4898
           MOVE SA (SAPT) TO A.                                             DMN4899
           IF A = '$' GO TO GNF2.                                           DMN4900
           ADD 1 TO CAPT.                                                   DMN4901
           MOVE A TO CA (CAPT).                                             DMN4902
           ADD 1 TO CNPT.                                                   DMN4903
           MOVE A TO CN (CNPT).                                             DMN4904
           GO TO GNF1.                                                      DMN4905
       GNF2. ADD 1 TO CAPT.                                                 DMN4906
           MOVE '=' TO CA (CAPT).                                           DMN4907
           ADD 1 TO CAPT.                                                   DMN4908
           MOVE 'E' TO CA (CAPT).                                           DMN4909
           ADD 1 TO CAPT.                                                   DMN4910
           MOVE '1' TO CA (CAPT).                                           DMN4911
           ADD 1 TO CAPT.                                                   DMN4912
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           MOVE '4' TO CA (CAPT).                                    DMN4913
           ADD 1 TO CAPT.                                            DMN4914
           MOVE '.' TO CA (CAPT).                                    DMN4915
           ADD 1 TO CAPT.                                            DMN4916
           MOVE '7' TO CA (CAPT).                                    DMN4917
           ADD 1 TO CAPT.                                            DMN4918
           MOVE ',' TO CA (CAPT).                                    DMN4919
           ADD 1 TO CNPT.                                            DMN4920
           MOVE ',' TO CN (CNPT).                                    DMN4921
           PERFORM GET-SYMBOL.                                       DMN4922
           IF GSNU1 NOT = 1 GO TO GNF.                               DMN4923
           MOVE 1 TO GNFU1.                                          DMN4924
       GNF99. IF CA (CAPT) NOT = ',' ADD 1 TO CAPT.                  DMN4925
           IF CN (CNPT) NOT = ',' ADD 1 TO CNPT.                     DMN4926
           MOVE ')' TO CA (CAPT).                                    DMN4927
           ADD 1 TO CAPT.                                            DMN4928
           MOVE '$' TO CA (CAPT).                                    DMN4929
           MOVE '$' TO CN (CNPT).                                    DMN4930
           NOTE FINISH GENERATE-FORMAT.                              DMN4931
       MVOUSTM SECTION.                                              DMN4932
       MVOUSTM1. MOVE 0 TO PTR.                                      DMN4933
           MOVE 0 TO CNPT.                                           DMN4934
       BDC1. ADD 1 TO PTR.                                           DMN4935
           MOVE TR (PTR) TO A.                                       DMN4936
           IF A = '$' GO TO MVOUSTMX.                                DMN4937
           IF A = '*' GO TO BDC3.                                    DMN4938
           ADD 1 TO CNPT.                                            DMN4939
           MOVE A TO CN (CNPT).                                      DMN4940
           GO TO BDC1.                                               DMN4941
       BDC3. MOVE 0 TO D5.                                           DMN4942
       BDC31. ADD 1 TO D5.                                           DMN4943
           ADD 1 TO CNPT.                                            DMN4944
           MOVE A5 (D5) TO CN (CNPT).                                DMN4945
           IF D5 LESS THAN 5 GO TO BDC31.                            DMN4946
           GO TO BDC1.                                               DMN4947
       MVOUSTMX. EXIT.                                               DMN4948
           NOTE FINISH MVOUSTM.                                      DMN4949
       SAVE-REG SECTION.                                             DMN4950
       SR. MOVE '      NSAVE = N2$       ' TO CARD-AREA.             DMN4951
           PERFORM WIND-UP.                                          DMN4952
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       MOVE '       N2    = N2D$          ' TO CARD-AREA.          DMN4953
       PERFORM WIND-UP.                                           DMN4954
       MOVE '       N2D   = NSAVE$        'TO CARD-AREA.           DMN4955
       PERFORM WIND-UP.                                           DMN4956
       MOVE '       NSAVE = NF2$          ' TO CARD-AREA.          DMN4957
       PERFORM WIND-UP.                                           DMN4958
       MOVE '       NF2   = NF2D$         ' TO CARD-AREA.          DMN4959
       PERFORM WIND-UP.                                           DMN4960
       MOVE '       NF2D  = NSAVE$        ' TO CARD-AREA.          DMN4961
       PERFORM WIND-UP.                                           DMN4962
       NOTE FINISH SAVE-REG.                                      DMN4963
   SAVE-REG-2 SECTION.                                            DMN4964
   SAR2. MOVE ZERO TO ZORRO, NOTE NO-OP.                          DMN4965
       MOVE '       NSAVE = NF1$          ' TO CARD-AREA.          DMN4966
       PERFORM WIND-UP.                                           DMN4967
       MOVE '       NF1   = NF1D$         ' TO CARD-AREA.          DMN4968
       PERFORM WIND-UP.                                           DMN4969
       MOVE '       NF1D  = NSAVE$        ' TO CARD-AREA.          DMN4970
       PERFORM WIND-UP.                                           DMN4971
       NOTE FINISH SAVE-REG-2.                                    DMN4972
   INTAKE-INITIAL-VALUES SECTION.                                 DMN4973
   AV. MOVE 1 TO PNU.                                             DMN4974
       MOVE SYMBOL-TABLE-CODE TO N.                               DMN4975
   AV1. PERFORM UNPACK.                                           DMN4976
       IF PNU1 = 1 GO TO AVX.                                     DMN4977
       MOVE TEMPORARY TO TABLE-AREA.                              DMN4978
       IF TBTYPE NOT = 'B' GO TO AV1.                             DMN4979
       IF TBL3S (1, 5) NOT = '$' GO TO AVA.                       DMN4980
       MOVE '      OY(00000,N2) = R12345678$          ' TO         DMN4981
               CARD-AREA.                                         DMN4982
       MOVE TBL2 (1) TO CA (10).                                  DMN4983
       MOVE TBL2 (2) TO CA (11).                                  DMN4984
       MOVE TBL2 (3) TO CA (12).                                  DMN4985
       MOVE TBL2 (4) TO CA (13).                                  DMN4986
       MOVE TBL2 (5) TO CA (14).                                  DMN4987
       MOVE TBL1 (1) TO CA (22).                                  DMN4988
       MOVE TBL1 (2) TO CA (23).                                  DMN4989
       MOVE TBL1 (3) TO CA (24).                                  DMN4990
       MOVE TBL1 (4) TO CA (25).                                  DMN4991
       MOVE TBL1 (5) TO CA (26).                                  DMN4992
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      MOVE TBL1 (6) TO CA (27).                                          DMN4993
      MOVE TBL1 (7) TO CA (28).                                          DMN4994
      MOVE TBL1 (8) TO CA (29).                                          DMN4995
      MOVE TBL1 (9) TO CA (30).                                          DMN4996
      PERFORM WIND-UP.                                                   DMN4997
      GO TO AV1.                                                         DMN4998
  AVA. ADD 1 TO AVAILABLE-SNM.                                           DMN4999
      MOVE 0 TO TBPT.                                                    DMN5000
  AVA1. ADD 1 TO TBPT.                                                   DMN5001
      IF TBL3S (TBPT, 5) = '$' GO TO AVA9.                               DMN5002
      MOVE '      DO 00000 NY0 = 1,00000$                      ' TO      DMN5003
           CARD-AREA.                                                    DMN5004
      MOVE AVAILABLE-SNM TO AL5.                                         DMN5005
      MOVE A5 (1) TO CA (10).                                            DMN5006
      MOVE A5 (2) TO CA (11).                                            DMN5007
      MOVE A5 (3) TO CA (12).                                            DMN5008
      MOVE A5 (4) TO CA (13).                                            DMN5009
      MOVE A5 (5) TO CA (14).                                            DMN5010
      MOVE TBPT TO REG2.                                                 DMN5011
      MOVE R2 (2) TO CA (18).                                            DMN5012
      MOVE TBL3 (TBPT) TO AL5.                                           DMN5013
      MOVE A5 (1) TO CA (24).                                            DMN5014
      MOVE A5 (2) TO CA (25).                                            DMN5015
      MOVE A5 (3) TO CA (26).                                            DMN5016
      MOVE A5 (4) TO CA (27).                                            DMN5017
      MOVE A5 (5) TO CA (28).                                            DMN5018
      PERFORM WIND-UP.                                                   DMN5019
      GO TO AVA1.                                                        DMN5020
  AVA9. MOVE 0 TO TBPT.                                                  DMN5021
      MOVE '      NY01 = 00000$      ' TO CARD-AREA.                     DMN5022
      MOVE TBL2 (1) TO CA (14).                                          DMN5023
      MOVE TBL2 (2) TO CA (15).                                          DMN5024
      MOVE TBL2 (3) TO CA (16).                                          DMN5025
      MOVE TBL2 (4) TO CA (17).                                          DMN5026
      MOVE TBL2 (5) TO CA (18).                                          DMN5027
      MOVE 00001 TO INCR.                                                DMN5028
      MOVE 18 TO CAPT.                                                   DMN5029
  AVA8. ADD 1 TO CAPT.                                                   DMN5030
      MOVE '+' TO CA (CAPT).                                             DMN5031
      ADD 1 TO CAPT.                                                     DMN5032
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           MOVE '(' TO CA (CAPT).                                    DMN5033
           ADD 1 TO CAPT.                                            DMN5034
           MOVE 'N' TO CA (CAPT).                                    DMN5035
           ADD 1 TO CAPT.                                            DMN5036
           MOVE 'Y' TO CA (CAPT).                                    DMN5037
           ADD 1 TO CAPT.                                            DMN5038
           ADD 1 TO TBPT.                                            DMN5039
           MOVE TBPT TO REG2.                                        DMN5040
           SUBTRACT 1 FROM TBPT.                                     DMN5041
           MOVE R2 (2) TO CA (CAPT).                                 DMN5042
           ADD 1 TO CAPT.                                            DMN5043
           MOVE '-' TO CA(CAPT).                                     DMN5044
           ADD 1 TO CAPT.                                            DMN5045
           MOVE '1' TO CA (CAPT).                                    DMN5046
           ADD 1 TO CAPT.                                            DMN5047
           MOVE ')' TO CA (CAPT).                                    DMN5048
           IF INCR = 00001 GO TO AVA7.                               DMN5049
           ADD 1 TO CAPT.                                            DMN5050
           MOVE '*' TO CA (CAPT).                                    DMN5051
           MOVE INCR TO AL5.                                         DMN5052
           ADD 1 TO CAPT.                                            DMN5053
           MOVE A5 (1) TO CA (CAPT).                                 DMN5054
           ADD 1 TO CAPT.                                            DMN5055
           MOVE A5 (2) TO CA (CAPT).                                 DMN5056
           ADD 1 TO CAPT.                                            DMN5057
           MOVE A5 (3) TO CA (CAPT).                                 DMN5058
           ADD 1 TO CAPT.                                            DMN5059
           MOVE A5 (4) TO CA (CAPT).                                 DMN5060
           ADD 1 TO CAPT.                                            DMN5061
           MOVE A5 (5) TO CA (CAPT).                                 DMN5062
       AVA7. ADD 2 TO TBPT.                                          DMN5063
           IF TBL3S (TBPT, 5) = '$' GO TO AVA6.                      DMN5064
           SUBTRACT 1 FROM TBPT.                                     DMN5065
           MOVE TBL3 (TBPT) TO AL5.                                  DMN5066
           PERFORM AL5-NM5.                                          DMN5067
           COMPUTE INCR = INCR * NM5.                                DMN5068
           GO TO AVA8.                                               DMN5069
       AVA6. ADD 1 TO CAPT.                                          DMN5070
           MOVE '$' TO CA (CAPT).                                    DMN5071
           PERFORM WIND-UP.                                          DMN5072
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     MOVE '      OY(NY01,N2) = R2345678(NY1,NY2,NY3,NY4,NY5,NY6,NY DMN5073
-'7,NY8,NY9)$      ' TO CARD-AREA.                                  DMN5074
     MOVE TBL1 (1) TO CA (20).                                      DMN5075
     MOVE TBL1 (2) TO CA (21).                                      DMN5076
     MOVE TBL1 (3) TO CA (22).                                      DMN5077
     MOVE TBL1 (4) TO CA (23).                                      DMN5078
     MOVE TBL1 (5) TO CA (24).                                      DMN5079
     MOVE TBL1 (6) TO CA (25).                                      DMN5080
     MOVE TBL1 (7) TO CA (26).                                      DMN5081
     MOVE TBL1 (8) TO CA (27).                                      DMN5082
     MOVE TBL1 (9) TO CA (28).                                      DMN5083
     COMPUTE CAPT = 25 + T8PT * 4.                                  DMN5084
     MOVE ')' TO CA (CAPT).                                         DMN5085
     ADD 1 TO CAPT.                                                 DMN5086
     MOVE '$' TO CA (CAPT).                                         DMN5087
     MOVE AVAILABLE-SNM TO DSN.                                     DMN5088
     PERFORM WIND-UP.                                               DMN5089
     GO TO AV1.                                                     DMN5090
 AVX. EXIT.                                                         DMN5091
     NOTE FINISH INTAKE-INITIAL-VALUE.                              DMN5092
 GENERATE-CGT SECTION.                                              DMN5093
 CGS. IF TM (6) NOT = '$' GO TO CGS1.                               DMN5094
     MOVE '      GO TO 00000$      ' TO CARD-AREA.                  DMN5095
     MOVE TM (1) TO CA (13).                                        DMN5096
     MOVE TM (2) TO CA (14).                                        DMN5097
     MOVE TM (3) TO CA (15).                                        DMN5098
     MOVE TM (4) TO CA (16).                                        DMN5099
     MOVE TM (5) TO CA (17).                                        DMN5100
     MOVE 17 TO CAPT.                                               DMN5101
     GO TO CGS7.                                                    DMN5102
 CGS1. MOVE '      GO TO (         ' TO CARD-AREA.                  DMN5103
     MOVE 13 TO CAPT.                                               DMN5104
     MOVE 0 TO PTM.                                                 DMN5105
 CGS2. MOVE 6 TO CNPT4.                                             DMN5106
 CGS3. SUBTRACT 1 FROM CNPT4.                                       DMN5107
     IF CNPT4 = 0 GO TO CGS4.                                       DMN5108
     ADD 1 TO PTM.                                                  DMN5109
     MOVE TM (PTM) TO A.                                            DMN5110
     IF A = '$' GO TO CGS5.                                         DMN5111
     ADD 1 TO CAPT.                                                 DMN5112
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           MOVE A TO CA (CAPT).                                    DMN5113
           GO TO CGS3.                                             DMN5114
       CGS4. ADD 1 TO CAPT.                                        DMN5115
           MOVE ',' TO CA (CAPT).                                  DMN5116
           GO TO CGS2.                                             DMN5117
       CGS5. MOVE ')' TO CA (CAPT).                                DMN5118
           ADD 1 TO CAPT.                                          DMN5119
           MOVE ',' TO CA (CAPT).                                  DMN5120
           MOVE 0 TO CNPT4.                                        DMN5121
       CGS6. ADD 1 TO CNPT4.                                       DMN5122
           IF CNPT4 = 7 GO TO CGS7.                                DMN5123
           ADD 1 TO CAPT.                                          DMN5124
           MOVE R9 (CNPT4) TO CA (CAPT).                           DMN5125
           GO TO CGS6.                                             DMN5126
       CGS7. ADD 1 TO CAPT.                                        DMN5127
           MOVE '$' TO CA (CAPT).                                  DMN5128
           PERFORM WIND-UP.                                        DMN5129
           NOTE FINISH GENERATE-CGT.                               DMN5130
       START-GET-SYMBOL SECTION.                                   DMN5131
       SGSSGS. MOVE 0 TO GSNU1.                                    DMN5132
           MOVE 0 TO ADR.                                          DMN5133
       SGS. IF N = BASIC-LIST-CODE GO TO SGS5.                     DMN5134
           IF SUPD = 1 GO TO SGS1.                                 DMN5135
           MOVE 'S' TO GSP.                                        DMN5136
           GO TO SGS7.                                             DMN5137
       SGS1. MOVE 1 TO PNU.                                        DMN5138
           PERFORM UNPACK.                                         DMN5139
           MOVE TEMPORARY TO INTERMEDIATE.                         DMN5140
           ALTER GS TO PROCEED TO GSL.                             DMN5141
           MOVE 0 TO PTM.                                          DMN5142
       SGS2. ADD 1 TO PTM.                                         DMN5143
           IF TM (PTM) NOT = ',' GO TO SGS2.                       DMN5144
           GO TO SGSX.                                             DMN5145
       SGS5. IF BASD = 1 GO TO SGS1.                               DMN5146
           MOVE 'B' TO GSP.                                        DMN5147
       SGS7. ALTER GS TO PROCEED TO GS11.                          DMN5148
           MOVE ' ' TO TBL1 (1).                                   DMN5149
           MOVE 1 TO PNU.                                          DMN5150
           MOVE SYMBOL-TABLE-CODE TO N.                            DMN5151
       SGS7A. PERFORM UNPACK.                                      DMN5152
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    IF PNU1 NOT = 1 GO TO SGS7B.                                    DMN5153
    MOVE '$' TO TBL1 (1).                                           DMN5154
    GO TO SGSX.                                                     DMN5155
SGS7B. MOVE TEMPORARY TO TABLE-AREA.                                DMN5156
    IF TBTYPE = 'X' AND GSP = 'S' GO TO ARID1.                      DMN5157
    IF TBTYPE NOT = GSP GO TO SGS7A.                                DMN5158
ARID1. MOVE ZERO TO ZORRO, NOTE NO-OP.                              DMN5159
    MOVE TABLE-AREA TO TABLE-AREA-2.                                DMN5160
    MOVE STP (SYMBOL-TABLE-CODE) TO GNFFF.                          DMN5161
SGSX. EXIT.                                                         DMN5162
    NOTE FINISH START-GET-SYMBOL.                                   DMN5163
GET-SYMBOL SECTION.                                                 DMN5164
GS. GO TO GS11.                                                     DMN5165
GS11. MOVE TABLE-AREA-2 TO TABLE-AREA.                              DMN5166
    MOVE GNFFF TO STP (SYMBOL-TABLE-CODE).                          DMN5167
    IF TBL1 (1) NOT = '$' GO TO GS12.                               DMN5168
GS11A. MOVE 1 TO GSNU1.                                             DMN5169
    GO TO GSX.                                                      DMN5170
GS12. ADD 1 TO ADR.                                                 DMN5171
GS12A. IF TBL3S (1, 5) NOT = '$' GO TO GS5.                         DMN5172
    MOVE TB1 TO SASA.                                               DMN5173
    MOVE '$' TO SA (10).                                            DMN5174
    MOVE 10 TO SAPT.                                                DMN5175
    MOVE SYMBOL-TABLE-CODE TO N.                                    DMN5176
GS99. PERFORM UNPACK.                                               DMN5177
    IF PNU1 = 1 GO TO GS13.                                         DMN5178
    MOVE TEMPORARY TO TABLE-AREA.                                   DMN5179
    IF TBTYPE = 'X' AND GSP = 'S' GO TO ARID2.                      DMN5180
    IF TBTYPE NOT = GSP GO TO GS99.                                 DMN5181
ARID2. MOVE ZERO TO ZORRO, NOTE NO-OP.                              DMN5182
    MOVE 0 TO ADR.                                                  DMN5183
GSX1. MOVE TABLE-AREA TO TABLE-AREA-2.                              DMN5184
    MOVE STP (SYMBOL-TABLE-CODE) TO GNFFF.                          DMN5185
    GO TO GSX.                                                      DMN5186
GS13. MOVE '$' TO TBL1 (1).                                         DMN5187
    GO TO GSX1.                                                     DMN5188
GS5. MOVE 0 TO SAPT.                                                DMN5189
GS6. ADD 1 TO SAPT.                                                 DMN5190
    IF SAPT = 10 GO TO GS7.                                         DMN5191
    IF TBL1 (SAPT) = ' ' GO TO GS7.                                 DMN5192
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     MOVE TBL1 (SAPT) TO SA (SAPT).                                    DMN5193
     GO TO GS6.                                                        DMN5194
 GS7. MOVE '(' TO SA (SAPT).                                           DMN5195
     MOVE 0 TO TBPT.                                                   DMN5196
     MOVE ADR TO ADRC.                                                 DMN5197
     SUBTRACT 1 FROM ADRC.                                             DMN5198
 GS2. ADD 1 TO TBPT.                                                   DMN5199
     MOVE TBL3 (TBPT) TO AL5.                                          DMN5200
     IF A5 (5) = '$' GO TO GS1.                                        DMN5201
     PERFORM AL5-NM5.                                                  DMN5202
     MOVE ADRC TO ADRD.                                                DMN5203
     COMPUTE ADRC = ADRC / NM5.                                        DMN5204
     COMPUTE NM5 = ADRD + 1 - ADRC * NM5.                              DMN5205
     MOVE NM5 TO AL5.                                                  DMN5206
     MOVE 0 TO CNPT4.                                                  DMN5207
 GS3. ADD 1 TO CNPT4.                                                  DMN5208
     IF A5 (CNPT4) = '0' GO TO GS3.                                    DMN5209
 GS4A. ADD 1 TO SAPT.                                                  DMN5210
     MOVE A5 (CNPT4) TO SA (SAPT).                                     DMN5211
     ADD 1 TO CNPT4.                                                   DMN5212
     IF CNPT4 IS NOT GREATER THAN 5 GO TO GS4A.                        DMN5213
     ADD 1 TO SAPT.                                                    DMN5214
     MOVE ',' TO SA (SAPT).                                            DMN5215
     GO TO GS2.                                                        DMN5216
 GS1. IF ADRC NOT = 0 GO TO GS4.                                       DMN5217
     MOVE ')' TO SA (SAPT).                                            DMN5218
 GS1A. ADD 1 TO SAPT.                                                  DMN5219
     IF SAPT NOT LESS THAN 10 GO TO GS1B.                              DMN5220
     MOVE ' ' TO SA (SAPT).                                            DMN5221
     GO TO GS1A.                                                       DMN5222
 GS1B. MOVE '$' TO SA (SAPT).                                          DMN5223
     GO TO GSX1.                                                       DMN5224
 GS4. MOVE SYMBOL-TABLE-CODE TO N.                                     DMN5225
 GS98. PERFORM UNPACK.                                                 DMN5226
     IF PNU1 = 1 GO TO GS11A.                                          DMN5227
     MOVE TEMPORARY TO TABLE-AREA.                                     DMN5228
     IF TBTYPE = 'X' AND GSP = 'S' GO TO ARID3.                        DMN5229
     IF TBTYPE NOT = GSP GO TO GS98.                                   DMN5230
 ARID3. MOVE ZERO TO ZORRO, NOTE NO-OP.                                DMN5231
     MOVE 1 TO ADR.                                                    DMN5232
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           GO TO GS12A.                                                  DMN5233
       GSL. IF TM (PTM) = '$' GO TO GS11A.                               DMN5234
           MOVE 0 TO BC.                                                 DMN5235
           MOVE 0 TO SAPT.                                               DMN5236
       GSL1. ADD 1 TO PTM.                                               DMN5237
           MOVE TM (PTM) TO A.                                           DMN5238
           IF A = ' ' GO TO GSL1.                                        DMN5239
           IF A = '$' GO TO GSL2.                                        DMN5240
           IF A = ',' AND BC = 0 GO TO GSL2.                             DMN5241
           IF A = '(' ADD 1 TO BC.                                       DMN5242
           IF A = ')' SUBTRACT 1 FROM BC.                                DMN5243
           ADD 1 TO SAPT.                                                DMN5244
           MOVE A TO SA (SAPT).                                          DMN5245
           GO TO GSL1.                                                   DMN5246
       GSL2. ADD 1 TO SAPT.                                              DMN5247
           IF SAPT IS NOT LESS THAN 10 GO TO GSL2A.                      DMN5248
           MOVE ' ' TO SA (SAPT).                                        DMN5249
           GO TO GSL2.                                                   DMN5250
       GSL2A. MOVE '$' TO SA (SAPT).                                     DMN5251
       GSX. EXIT.                                                        DMN5252
           NOTE FINISH GET-SYMBOL.                                       DMN5253
       TABLES-TO-FUNCTION-CARDS SECTION.                                 DMN5254
       TC. MOVE ' 4799 DY(1,NF2) = 1.$    ' TO CARD-AREA.                DMN5255
           PERFORM WIND-UP.                                              DMN5256
           MOVE SYMBOL-TABLE-CODE TO N.                                  DMN5257
           MOVE 1 TO PNU.                                                DMN5258
       TC1. PERFORM UNPACK.                                              DMN5259
           IF PNU1 = 1 GO TO TC2.                                        DMN5260
           MOVE TEMPORARY TO TABLE-AREA.                                 DMN5261
           IF TB3 NOT = 'F' GO TO TC1.                                   DMN5262
           IF TBL3S (1, 5) NOT = '$' GO TO TC0.                          DMN5263
           MOVE '      DY(12345,NF2)=DY(12345,N2)$                ' TO   DMN5264
                CARD-AREA.                                               DMN5265
           MOVE TBL2 (1) TO CA (10).                                     DMN5266
           MOVE TBL2 (2) TO CA (11).                                     DMN5267
           MOVE TBL2 (3) TO CA (12).                                     DMN5268
           MOVE TBL2 (4) TO CA (13).                                     DMN5269
           MOVE TBL2 (5) TO CA (14).                                     DMN5270
           MOVE TB2 TO AL5.                                              DMN5271
           PERFORM AL5-NM5.                                              DMN5272
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      ADD 1 TO NM5.                                                    DMN5273
      MOVE NM5 TO TB2.                                                 DMN5274
      MOVE TBL2 (1) TO CA (24).                                        DMN5275
      MOVE TBL2 (2) TO CA (25).                                        DMN5276
      MOVE TBL2 (3) TO CA (26).                                        DMN5277
      MOVE TBL2 (4) TO CA (27).                                        DMN5278
      MOVE TBL2 (5) TO CA (28).                                        DMN5279
      PERFORM WIND-UP.                                                 DMN5280
      GO TO TC1.                                                       DMN5281
  TCD. ADD 1 TO AVAILABLE-SNM.                                         DMN5282
  T2. MOVE '      DO 12345 NY1 = 1,12345$                    ' TO     DMN5283
          CARD-AREA.                                                   DMN5284
      MOVE AVAILABLE-SNM TO AL5.                                       DMN5285
      MOVE A5 (1) TO CA (10).                                          DMN5286
      MOVE A5 (2) TO CA (11).                                          DMN5287
      MOVE A5 (3) TO CA (12).                                          DMN5288
      MOVE A5 (4) TO CA (13).                                          DMN5289
      MOVE A5 (5) TO CA (14).                                          DMN5290
      MOVE 00001 TO INCR.                                              DMN5291
      MOVE 0 TO TBPT.                                                  DMN5292
  T4. ADD 1 TO TBPT.                                                   DMN5293
      MOVE TBL3 (TBPT) TO AL5.                                         DMN5294
      IF A5 (5) = '$' GO TO T5.                                        DMN5295
      PERFORM AL5-NM5.                                                 DMN5296
      COMPUTE INCR = INCR * NM5.                                       DMN5297
      GO TO T4.                                                        DMN5298
  T5. MOVE INCR TO AL5.                                                DMN5299
      MOVE A5 (1) TO CA (24).                                          DMN5300
      MOVE A5 (2) TO CA (25).                                          DMN5301
      MOVE A5 (3) TO CA (26).                                          DMN5302
      MOVE A5 (4) TO CA (27).                                          DMN5303
      MOVE A5 (5) TO CA (28).                                          DMN5304
      PERFORM WIND-UP.                                                 DMN5305
      MOVE AVAILABLE-SNM TO DSN.                                       DMN5306
      MOVE '      OY(NY1+12345,NF2) = OY(NY1+12345,N2)$      ' TO     DMN5307
          CARD-AREA.                                                   DMN5308
      MOVE TB2 TO AL5.                                                 DMN5309
      PERFORM AL5-NM5.                                                 DMN5310
      SUBTRACT 1 FROM NM5.                                             DMN5311
      MOVE NM5 TO AL5.                                                 DMN5312
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           MOVE A5 (1) TO CA (14).                                  DMN5313
           MOVE A5 (2) TO CA (15).                                  DMN5314
           MOVE A5 (3) TO CA (16).                                  DMN5315
           MOVE A5 (4) TO CA (17).                                  DMN5316
           MOVE A5 (5) TO CA (18).                                  DMN5317
           ADD INCR TO NM5.                                         DMN5318
           MOVE NM5 TO AL5.                                         DMN5319
           MOVE A5 (1) TO CA (34).                                  DMN5320
           MOVE A5 (2) TO CA (35).                                  DMN5321
           MOVE A5 (3) TO CA (36).                                  DMN5322
           MOVE A5 (4) TO CA (37).                                  DMN5323
           MOVE A5 (5) TO CA (38).                                  DMN5324
           PERFORM WIND-UP.                                         DMN5325
           GO TO TC1.                                               DMN5326
       TC2. MOVE 1 TO PNU.                                          DMN5327
       TC3. MOVE FUNCTION-CARDS-CODE TO N.                          DMN5328
           PERFORM UNPACK.                                          DMN5329
           IF PNU1 = 1 GO TO TC4.                                   DMN5330
           PERFORM TRANSLATE-CARD.                                  DMN5331
           GO TO TC3.                                               DMN5332
       TC4. EXIT.                                                   DMN5333
           NOTE FINISH TABLES-TO-FUNCTION-CARDS.                    DMN5334
       TRANSLATE-CARD SECTION.                                      DMN5335
       TCST. IF TR (1) NOT = 'C' GO TO TC31.                        DMN5336
           MOVE TEMPORARY TO CARD-AREA.                             DMN5337
           PERFORM WIND-UP.                                         DMN5338
           GO TO TD88.                                              DMN5339
       TC31. MOVE TEMPORARY TO CNCN.                                DMN5340
           MOVE SPACES TO IFIF.                                     DMN5341
           MOVE ZERO TO AL5.                                        DMN5342
           MOVE ZERO TO CNPT.                                       DMN5343
       TC31A. ADD 1 TO CNPT.                                        DMN5344
           IF CNPT = 6 GO TO TC31B.                                 DMN5345
           MOVE CN (CNPT) TO A.                                     DMN5346
           IF A = ' ' GO TO TC31A.                                  DMN5347
           MOVE A5 (2) TO A5 (1).                                   DMN5348
           MOVE A5 (3) TO A5 (2).                                   DMN5349
           MOVE A5 (4) TO A5 (3).                                   DMN5350
           MOVE A5 (5) TO A5 (4).                                   DMN5351
           MOVE A TO A5 (5).                                        DMN5352
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    GO TO TC31A.                                                    DMN5353
TC31B. IF AL5 = '00000' GO TO TC32.                                 DMN5354
    MOVE AL5 TO DSN.                                                DMN5355
    MOVE 1 TO PNU.                                                  DMN5356
TC33. MOVE DO-TABLE-CODE TO N.                                      DMN5357
    PERFORM UNPACK.                                                 DMN5358
    IF PNU1 = 1 GO TO TC32.                                         DMN5359
    MOVE TEMPORARY TO DO-NUM.                                       DMN5360
    IF AL5 NOT = OR-DO GO TO TC33.                                  DMN5361
    MOVE NED (1) TO IFA (1).                                        DMN5362
    MOVE NED (2) TO IFA (2).                                        DMN5363
    MOVE NED (3) TO IFA (3).                                        DMN5364
    MOVE NED (4) TO IFA (4).                                        DMN5365
    MOVE NED (5) TO IFA (5).                                        DMN5366
TC32. MOVE 6 TO CNPT.                                               DMN5367
    MOVE 6 TO IFPT.                                                 DMN5368
    MOVE 0 TO NCT.                                                  DMN5369
    GO TO TD1.                                                      DMN5370
TD2. ADD 1 TO CNPT.                                                 DMN5371
    MOVE CN (CNPT) TO A.                                            DMN5372
    ADD 1 TO IFPT.                                                  DMN5373
    MOVE A TO IFA (IFPT).                                           DMN5374
    IF A = ' ' GO TO TD2.                                           DMN5375
    IF A = '+' GO TO TD1.                                           DMN5376
    IF A = '-' GO TO TD1.                                           DMN5377
    IF A = '*' GO TO TD1.                                           DMN5378
    IF A = '/' GO TO TD1.                                           DMN5379
    IF A = ')' GO TO TD1.                                           DMN5380
    IF A = '(' GO TO TD1.                                           DMN5381
    IF A = '=' GO TO TD1.                                           DMN5382
    IF A = '.' GO TO TD1.                                           DMN5383
    IF A = ',' GO TO TD1.                                           DMN5384
    GO TO TD2.                                                      DMN5385
TD1. MOVE SPACES TO REG9.                                           DMN5386
    MOVE CNPT TO CNPT2.                                             DMN5387
    MOVE IFPT TO IFPT2.                                             DMN5388
    MOVE 0 TO NO-GO.                                                DMN5389
TD1111. ADD 1 TO CNPT.                                              DMN5390
    MOVE CN (CNPT) TO A.                                            DMN5391
    IF A NOT = ' ' GO TO TD1112.                                    DMN5392
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    ADD 1 TO IFPT.                                          DMN5393
    GO TO TD1111.                                           DMN5394
TD1112. SUBTRACT 1 FROM CNPT.                               DMN5395
TD11. ADD 1 TO CNPT.                                        DMN5396
    MOVE CN (CNPT) TO A.                                    DMN5397
    IF A = ' ' GO TO TD11.                                  DMN5398
    MOVE A TO C.                                            DMN5399
    IF A = '+' GO TO TD4.                                   DMN5400
    IF A = '-' GO TO TD4.                                   DMN5401
    IF A = '*' GO TO TD4.                                   DMN5402
    IF A = '/' GO TO TD4.                                   DMN5403
    IF A = ')' GO TO TD4.                                   DMN5404
    IF A = '=' GO TO TD4.                                   DMN5405
    IF A = '$' GO TO TD4.                                   DMN5406
    IF A = '.' GO TO TD4.                                   DMN5407
    IF A = '(' GO TO TD4.                                   DMN5408
    IF A = ',' GO TO TD4.                                   DMN5409
    IF R9 (1) = ' ' GO TO TD12.                             DMN5410
    MOVE 1 TO NO-GO.                                        DMN5411
    GO TO TD11.                                             DMN5412
TD12. PERFORM R9LEFT.                                       DMN5413
    MOVE A TO R9 (9).                                       DMN5414
    GO TO TD11.                                             DMN5415
TD4. IF R9 (9) = ' ' GO TO TD43.                            DMN5416
    IF NO-GO = 1 GO TO TD43.                                DMN5417
    PERFORM R9LEFT-JUSTIFY.                                 DMN5418
    MOVE R9 (1) TO A.                                       DMN5419
    PERFORM FIXED-POINT-TEST.                               DMN5420
    IF FIXED-POINT GO TO TD43.                              DMN5421
    MOVE R9 (1) TO B.                                       DMN5422
    PERFORM NTEST.                                          DMN5423
    IF NUMBER GO TO TD43.                                   DMN5424
    MOVE 1 TO PNU.                                          DMN5425
TD41. MOVE SYMBOL-TABLE-CODE TO N.                          DMN5426
    PERFORM UNPACK.                                         DMN5427
    IF PNU1 = 1 GO TO TD43.                                 DMN5428
    MOVE TEMPORARY TO TABLE-AREA.                           DMN5429
    IF TB3 = 'X' GO TO TD41.                                DMN5430
    IF REG9 NOT = TB1 GO TO TD41.                           DMN5431
    IF C = '(' GO TO TD3.                                   DMN5432
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           IF TBL3S (1, 5) NOT = '$' GO TO DIM-ERA3.                    DMN5433
           ALTER TD421 TO PROCEED TO TD423.                             DMN5434
           IF TBTYPE = 'S' ALTER TD421 TO PROCEED TO TD422.             DMN5435
           ADD 1 TO IFPT.                                               DMN5436
           MOVE '0' TO IFA (IFPT).                                      DMN5437
           ADD 1 TO IFPT.                                               DMN5438
           MOVE 'Y' TO IFA (IFPT).                                      DMN5439
           ADD 1 TO IFPT.                                               DMN5 40
           MOVE '(' TO IFA (IFPT).                                      DMN5441
           MOVE 0 TO TBPT.                                              DMN5442
       TD42. ADD 1 TO IFPT.                                             DMN5443
           ADD 1 TO TBPT.                                               DMN5444
           MOVE TBL2 (TBPT) TO IFA (IFPT).                              DMN5445
           IF TBPT NOT = 5 GO TO TD42.                                  DMN5446
           ADD 1 TO IFPT.                                               DMN5447
           MOVE ',' TO IFA (IFPT).                                      DMN5448
           ADD 1 TO IFPT.                                               DMN5449
           MOVE 'N' TO IFA (IFPT).                                      DMN5450
       TD421. GO TO TD423.                                              DMN5451
       TD422. ADD 1 TO IFPT.                                            DMN5452
           MOVE 'F' TO IFA (IFPT).                                      DMN5453
       TD423. ADD 1 TO IFPT.                                            DMN5454
           MOVE '2' TO IFA (IFPT).                                      DMN5455
           ADD 1 TO IFPT.                                               DMN5456
           MOVE ')' TO IFA (IFPT).                                      DMN5457
           SUBTRACT 1 FROM CNPT.                                        DMN5458
           IF C NOT = '$' GO TO TD1.                                    DMN5459
       TDZ. ADD 1 TO IFPT.                                              DMN5460
           MOVE C TO IFA (IFPT).                                        DMN5461
           IF C NOT = '$' GO TO TD1.                                    DMN5462
           MOVE IFIF TO CARD-AREA.                                      DMN5463
           PERFORM WIND-UP.                                             DMN5464
           GO TO TD88.                                                  DMN5465
       TD43. MOVE CNPT2 TO CNPT.                                        DMN5466
           MOVE IFPT2 TO IFPT.                                          DMN5467
           IF C NOT = '$' GO TO TD2.                                    DMN5468
       TD431. ADD 1 TO CNPT.                                            DMN5469
           MOVE CN (CNPT) TO A.                                         DMN5 70
           ADD 1 TO IFPT.                                               DMN5471
           MOVE A TO IFA (IFPT).                                        DMN5472
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           IF A NOT = '$' GO TO TD431.                                  DMN5473
           MOVE IFIF TO CARD-AREA.                                      DMN5474
           PERFORM WIND-UP.                                             DMN5475
           GO TO TD88.                                                  DMN5476
       TD3. IF TBL3S (1, 5) = '$' GO TO DIM-ERA3.                       DMN5477
           MOVE '      NYO1=12345          ' TO CARD-AREA.              DMN5478
           ADD 1 TO NCT.                                                DMN5479
           MOVE NCT TO REG2.                                            DMN5480
           MOVE R2 (1) TO CA (09).                                      DMN5481
           MOVE R2 (2) TO CA (10).                                      DMN5482
           MOVE TBL2 (1) TO CA (12).                                    DMN5483
           MOVE TBL2 (2) TO CA (13).                                    DMN5484
           MOVE TBL2 (3) TO CA (14).                                    DMN5485
           MOVE TBL2 (4) TO CA (15).                                    DMN5486
           MOVE TBL2 (5) TO CA (16).                                    DMN5487
           MOVE 00001 TO INCR.                                          DMN5488
           MOVE 0 TO TBPT.                                              DMN5489
           MOVE 16 TO CAPT.                                             DMN5490
       TD8. ADD 1 TO CAPT.                                              DMN5491
           MOVE '+' TO CA (CAPT).                                       DMN5492
           ADD 1 TO CAPT.                                               DMN5493
           MOVE '(' TO CA (CAPT).                                       DMN5494
       TD5. ADD 1 TO CNPT.                                              DMN5495
           MOVE CM (CNPT) TO A.                                         DMN5496
           IF A = ',' GO TO TD55.                                       DMN5497
           IF A = ')' GO TO TD55.                                       DMN5498
           ADD 1 TO CAPT.                                               DMN5499
           MOVE A TO CA (CAPT).                                         DMN5500
           GO TO TD5.                                                   DMN5501
      TD55. ADD 1 TO CAPT.                                              DMN5502
           MOVE '-' TO CA (CAPT).                                       DMN5503
           ADD 1 TO CAPT.                                               DMN5504
           MOVE '1' TO CA (CAPT).                                       DMN5505
           ADD 1 TO CAPT.                                               DMN5506
           MOVE ')' TO CA (CAPT).                                       DMN5507
           IF INCR = 00001 GO TO TD6.                                   DMN5508
           ADD 1 TO CAPT.                                               DMN5509
           MOVE '*' TO CA (CAPT).                                       DMN5510
           MOVE INCR TO AL5.                                            DMN5511
           ADD 1 TO CAPT.                                               DMN5512
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           MOVE A5 (1) TO CA (CAPT).                                    DMN5513
           ADD 1 TO CAPT.                                               DMN5514
           MOVE A5 (2) TO CA (CAPT).                                    DMN5515
           ADD 1 TO CAPT.                                               DMN5516
           MOVE A5 (3) TO CA (CAPT).                                    DMN5517
           ADD 1 TO CAPT.                                               DMN5518
           MOVE A5 (4) TO CA (CAPT).                                    DMN5519
           ADD 1 TO CAPT.                                               DMN5520
           MOVE A5 (5) TO CA (CAPT).                                    DMN5521
       TD6. IF A = ')' GO TO TD7.                                       DMN5522
           ADD 1 TO TBPT.                                               DMN5523
           MOVE TBL3 (TBPT) TO AL5.                                     DMN5524
           IF A5 (5) = '$' GO TO DIM-ERA3.                              DMN5525
           PERFORM AL5-NM5.                                             DMN5526
           COMPUTE INCR = INCR * NM5.                                   DMN5527
           GO TO TD8.                                                   DMN5528
       TD7. ADD 2 TO TBPT.                                              DMN5529
           IF TBL3S (TBPT, 5) NOT = '$' GO TO DIM-ERA3.                 DMN5530
           ADD 1 TO CAPT.                                               DMN5531
           MOVE '$' TO CA (CAPT).                                       DMN5532
           PERFORM WIND-UP.                                             DMN5533
           ALTER TD711 TO PROCEED TO TD713.                             DMN5534
           IF TBTYPE = 'S' ALTER TD711 TO PROCEED TO TD712.             DMN5535
           ADD 1 TO IFPT.                                               DMN5536
           MOVE 'O' TO IFA (IFPT).                                      DMN5537
           ADD 1 TO IFPT.                                               DMN5538
           MOVE 'Y' TO IFA (IFPT).                                      DMN5539
           ADD 1 TO IFPT.                                               DMN5540
           MOVE '(' TO IFA (IFPT).                                      DMN5541
           ADD 1 TO IFPT.                                               DMN5542
           MOVE 'N' TO IFA (IFPT).                                      DMN5543
           ADD 1 TO IFPT.                                               DMN5544
           MOVE 'Y' TO IFA (IFPT).                                      DMN5545
           MOVE NCT TO REG2.                                            DMN5546
           ADD 1 TO IFPT.                                               DMN5547
            OVE R2 (1) TO IFA (IFPT).                                   DMN5548
           ADD 1 TO IFPT.                                               DMN5549
           MOVE R2 (2) TO IFA (IFPT).                                   DMN5550
           ADD 1 TO IFPT.                                               DMN5551
           MOVE ',' TO IFA (IFPT).                                      DMN5552
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      ADD 1 TO IFPT.                                              DMN5553
      MOVE 'N' TO IFA (IFPT).                                     DMN5554
  TD711. GO TO TD713.                                             DMN5555
  TD712. ADD 1 TO IFPT.                                           DMN5556
      MOVE 'F' TO IFA (IFPT).                                     DMN5557
  TD713. ADD 1 TO IFPT.                                           DMN5558
      MOVE '2' TO IFA (IFPT).                                     DMN5559
      ADD 1 TO IFPT.                                              DMN5560
      MOVE ')' TO IFA (IFPT).                                     DMN5561
  TD713AA. ADD 1 TO CNPT.                                         DMN5562
      MOVE CN (CNPT) TO C.                                        DMN5563
      IF C = ' ' GO TO TD713AA.                                   DMN5564
      IF C = '+' GO TO TDZ.                                       DMN5565
      IF C = '-' GO TO TDZ.                                       DMN5566
      IF C = '*' GO TO TDZ.                                       DMN5567
      IF C = '/' GO TO TDZ.                                       DMN5568
      IF C = '(' GO TO TDZ.                                       DMN5569
      IF C = '=' GO TO TDZ.                                       DMN5570
      IF C = '$' GO TO TDZ.                                       DMN5571
      IF C = '.' GO TO TDZ.                                       DMN5572
      IF C = '(' GO TO TDZ.                                       DMN5573
      IF C = ',' GO TO TDZ.                                       DMN5574
      PERFORM WIND-UP.                                            DMN5575
      GO TO TD713AA.                                              DMN5576
  DIM-ERA3. MOVE SPACES TO OUT.                                   DMN5577
      MOVE 'C INCORRECT DIMENSION FOR                ' TO         DMN5578
           OUTCARD.                                               DMN5579
      MOVE R9 (1) TO DC (27).                                     DMN5580
      MOVE R9 (2) TO DC (28).                                     DMN5581
      MOVE R9 (3) TO DC (29).                                     DMN5582
      MOVE R9 (4) TO DC (30).                                     DMN5583
      MOVE R9 (5) TO DC (31).                                     DMN5584
      MOVE R9 (6) TO DC (32).                                     DMN5585
      MOVE R9 (7) TO DC (33).                                     DMN5586
      MOVE R9 (8) TO DC (34).                                     DMN5587
      MOVE R9 (9) TO DC (35).                                     DMN5588
      PERFORM WRITE-OUT.                                          DMN5589
      GO TO UNUSUAL-END.                                          DMN5590
  TD88. EXIT.                                                     DMN5591
      NOTE FINISH TRANSLATE-CARD.                                 DMN5592
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OUT-METHOD SECTION.                                                    DMN5593
MEG1. PERFORM FIND-METHOD.                                             DMN5594
MEG2. MOVE METHOD-CODE TO N.                                           DMN5595
    PERFORM UNPACK.                                                    DMN5596
    MOVE TEMPORARY TO CNCN.                                            DMN5597
    PERFORM SCAN-CARD.                                                 DMN5598
    MOVE 1 TO PAD.                                                     DMN5599
    IF REG3 = 'ALL' PERFORM XXALL.                                     DMN5600
    IF REG3 = 'RES' PERFORM XXRES.                                     DMN5601
    IF REG3 = 'ROT' PERFORM XXROT.                                     DMN5602
    IF REG3 = 'FUN' PERFORM XXFUN.                                     DMN5603
    IF REG3 = 'CAL' PERFORM XXCAL.                                     DMN5604
    IF REG3 = 'LOO' PERFORM XXEXA.                                     DMN5605
    IF REG3 = 'EXA' PERFORM XXEXA.                                     DMN5606
    IF REG3 = 'END' GO TO MEG3.                                        DMN5607
    IF PAD = 0 GO TO MEG2.                                             DMN5608
    MOVE CNCN TO CARD-AREA.                                            DMN5609
    PERFORM WIND-UP.                                                   DMN5610
    GO TO MEG2.                                                        DMN5611
MEG3. IF MTYPE1 = 'R' GO TO MEG4.                                      DMN5612
    ADD 1 TO NPC.                                                      DMN5613
    MOVE '      NPC = 000$        ' TO CARD-AREA.                      DMN5614
    MOVE NPC TO AL5.                                                   DMN5615
    MOVE A5 (3) TO CA (13).                                            DMN5616
    MOVE A5 (4) TO CA (14).                                            DMN5617
    MOVE A5 (5) TO CA (15).                                            DMN5618
    PERFORM WIND-UP.                                                   DMN5619
    MOVE '      GO TO 4118$       ' TO CARD-AREA.                      DMN5620
    PERFORM WIND-UP.                                                   DMN5621
    MOVE '04900$' TO INTERMEDIATE.                                     DMN5622
    MOVE CGT7-CODE TO N.                                               DMN5623
    PERFORM PUT-AWAY.                                                  DMN5624
    GO TO MEGX.                                                        DMN5625
MEG4. IF MTYPE = 'R' GO TO MEG5.                                       DMN5626
    MOVE '      IF(NCPC) 4116,4116,4114$                 ' TO          DMN5627
         CARD-AREA.                                                    DMN5628
    PERFORM WIND-UP.                                                   DMN5629
    MOVE CGT5-CODE TO N.                                               DMN5630
    MOVE '$' TO TM (1).                                                DMN5631
    MOVE 1 TO TMPT.                                                    DMN5632
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    MOVE 1 TO PNU.                                                    DMN5633
MEG41. PERFORM UNPACK.                                                DMN5634
    IF PNU1 = 1 GO TO MEG42.                                          DMN5635
    SUBTRACT 1 FROM TMPT.                                             DMN5636
    MOVE 0 TO PTR.                                                    DMN5637
MEG43. ADD 1 TO TMPT.                                                 DMN5638
    ADD 1 TO PTR.                                                     DMN5639
    MOVE TR (PTR) TO TM (TMPT).                                       DMN5640
    IF TR (PTR) NOT = '$' GO TO MEG43.                                DMN5641
    GO TO MEG41.                                                      DMN5642
MEG42. MOVE 'NCPC     ' TO REG9.                                      DMN5643
    MOVE '04114' TO DSN.                                              DMN5644
    PERFORM GENERATE-CGT.                                             DMN5645
    MOVE '04116' TO DSN.                                              DMN5646
MEG5. MOVE '      IF(NV) 4118,4118,4175$                    ' TO      DMN5647
          CARD-AREA.                                                  DMN5648
    IF BCC NOT = 0 MOVE '3' TO CA (27).                               DMN5649
    PERFORM WIND-UP.                                                  DMN5650
    ADD 1 TO IFPT.                                                    DMN5651
    MOVE '$' TO IFA (IFPT).                                           DMN5652
    MOVE IFIF TO INTERMEDIATE.                                        DMN5653
    MOVE CGT6-CODE TO N.                                              DMN5654
    PERFORM PUT-AWAY.                                                 DMN5655
MEGX. EXIT.                                                           DMN5656
    NOTE FINISH OUT-METHOD.                                           DMN5657
XXEXA SECTION.                                                        DMN5658
XXEX1. PERFORM STATE.                                                 DMN5659
    MOVE 0 TO PAD.                                                    DMN5660
    IF MTYPE1 = 'P' GO TO XXEX2.                                      DMN5661
    MOVE '      GO TO 4118$       ' TO CARD-AREA.                     DMN5662
    PERFORM WIND-UP.                                                  DMN5663
    GO TO XXEXX.                                                      DMN5664
XXEX2. ADD 1 TO NPC.                                                  DMN5665
    MOVE '      NPC = 000$        ' TO CARD-AREA.                     DMN5666
    MOVE NPC TO AL5.                                                  DMN5667
    MOVE A5 (3) TO CA (13).                                           DMN5668
    MOVE A5 (4) TO CA (14).                                           DMN5669
    MOVE A5 (5) TO CA (15).                                           DMN5670
    PERFORM WIND-UP.                                                  DMN5671
    MOVE '      GO TO 4118$       ' TO CARD-AREA.                     DMN5672
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      PERFORM WIND-UP.                                          DMN5673
      ADD 1 TO AVAILABLE-SNM.                                   DMN5674
      MOVE AVAILABLE-SNM TO DSN.                                DMN5675
      MOVE DS (1) TO TM (1).                                    DMN5676
      MOVE DS (2) TO TM (2).                                    DMN5677
      MOVE DS (3) TO TM (3).                                    DMN5678
      MOVE DS (4) TO TM (4).                                    DMN5679
      MOVE DS (5) TO TM (5).                                    DMN5680
      MOVE '$' TO TM (6).                                       DMN5681
      MOVE CGT7-CODE TO N.                                      DMN5682
      PERFORM PUT-AWAY.                                         DMN5683
      MOVE '      CONTINUE$          ' TO CARD-AREA.            DMN5684
      PERFORM WIND-UP.                                          DMN5685
  XXEXX. EXIT.                                                  DMN5686
      NOTE FINISH XXEXA.                                        DMN5687
  XXFUN SECTION.                                                DMN5688
  XXF1. MOVE '      NF = 000$          ' TO CARD-AREA.          DMN5689
      MOVE 0 TO PAD.                                            DMN5690
      MOVE CN (1) TO CA (1).                                    DMN5691
      MOVE CN (2) TO CA (2).                                    DMN5692
      MOVE CN (3) TO CA (3).                                    DMN5693
      MOVE CN (4) TO CA (4).                                    DMN5694
      MOVE CN (5) TO CA (5).                                    DMN5695
      ADD 1 TO NF.                                              DMN5696
      MOVE NF TO AL5.                                           DMN5697
      MOVE A5 (3) TO CA (12).                                   DMN5698
      MOVE A5 (4) TO CA (13).                                   DMN5699
      MOVE A5 (5) TO CA (14).                                   DMN5700
      PERFORM WIND-UP.                                          DMN5701
      ADD 1 TO AVAILABLE-SNM.                                   DMN5702
      MOVE AVAILABLE-SNM TO AL5.                                DMN5703
      MOVE 0 TO D5.                                             DMN5704
  XXF2. ADD 1 TO D5.                                            DMN5705
      ADD 1 TO IFP1.                                            DMN5706
      MOVE A5 (D5) TO IFA (IFPT).                               DMN5707
      IF D5 LESS THAN 5 GO TO XXF2.                             DMN5708
      MOVE '      GO TO 4799$        ' TO CARD-AREA.           DMN5709
      PERFORM WIND-UP.                                          DMN5710
      MOVE AVAILABLE-SNM TO DSN.                                DMN5711
      MOVE '      CONTINUE$          ' TO CARD-AREA.           DMN5712
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      PERFORM WIND-UP.                                          DMN5713
      NOTE FINISH XXFUN.                                        DMN5714
  XXCAL SECTION.                                                DMN5715
  XXC1. PERFORM STATE.                                          DMN5716
      MOVE 0 TO PAD.                                            DMN5717
      ADD 1 TO NCPC.                                            DMN5718
      MOVE '      NCPC = 000$       ' TO CARD-AREA.             DMN5719
      MOVE NCPC TO AL5.                                         DMN5720
      MOVE A5 (3) TO CA (14).                                   DMN5721
      MOVE A5 (4) TO CA (15).                                   DMN5722
      MOVE A5 (5) TO CA (16).                                   DMN5723
      PERFORM WIND-UP.                                          DMN5724
      MOVE '      GO TO 4801$       ' TO CARD-AREA.             DMN5725
      PERFORM WIND-UP.                                          DMN5726
      ADD 1 TO AVAILABLE-SNM.                                   DMN5727
      MOVE AVAILABLE-SNM TO DSN.                                DMN5728
      MOVE DS (1) TO TM (1).                                    DMN5729
      MOVE DS (2) TO TM (2).                                    DMN5730
      MOVE DS (3) TO TM (3).                                    DMN5731
      MOVE DS (4) TO TM (4).                                    DMN5732
      MOVE DS (5) TO TM (5).                                    DMN5733
      MOVE '$' TO TM (6).                                       DMN5734
      MOVE CGT5-CODE TO N.                                      DMN5735
      PERFORM PUT-AWAY.                                         DMN5736
      MOVE '      NCPC = 0$         ' TO CARD-AREA.             DMN5737
      PERFORM WIND-UP.                                          DMN5738
      NOTE FINISH XXCAL.                                        DMN5739
  XXALL SECTION.                                                DMN5740
  XXALLX. PERFORM STATE.                                        DMN5741
      MOVE 0 TO PAD.                                            DMN5742
  XALL. MOVE 0 TO CNPT.                                         DMN5743
  XALLA. MOVE 0 TO CNPT4.                                       DMN5744
  XALL1. ADD 1 TO CNPT.                                         DMN5745
      MOVE CN (CNPT) TO A.                                      DMN5746
      IF A = '$' GO TO ALLX.                                    DMN5747
      IF A NOT = '(' GO TO XALL1.                               DMN5748
  XALL2. PERFORM MET63.                                         DMN5749
      ADD 1 TO CNPT4.                                           DMN5750
      MOVE SPACES TO CARD-AREA.                                 DMN5751
      MOVE 0 TO D5.                                             DMN5752
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      MOVE 6 TO CAPT.                                                  DMN5753
  XALL3. ADD 1 TO D5.                                                  DMN5754
      ADD 1 TO CAPT.                                                   DMN5755
      MOVE R9 (D5) TO CA (CAPT).                                       DMN5756
      IF D5 LESS THAN 9 GO TO XALL3.                                   DMN5757
      MOVE '=' TO CA (17).                                             DMN5758
      MOVE 'N' TO CA (19).                                             DMN5759
      MOVE 'R' TO CA (20).                                             DMN5760
      MOVE '(' TO CA (21).                                             DMN5761
      MOVE CNPT4 TO AL5.                                               DMN5762
      MOVE A5 (3) TO CA (22).                                          DMN5763
      MOVE A5 (4) TO CA (23).                                          DMN5764
      MOVE A5 (5) TO CA (24).                                          DMN5765
      MOVE ')' TO CA (25).                                             DMN5766
      MOVE '$' TO CA (26).                                             DMN5767
      PERFORM WIND-UP.                                                 DMN5768
      IF CN (CNPT) = ',' GO TO XALL2.                                  DMN5769
      MOVE '      DO 00000 NK = 1,000$                          ' TO   DMN5770
           CARD-AREA.                                                  DMN5771
      ADD 1 TO AVAILABLE-SNM.                                          DMN5772
      MOVE AVAILABLE-SNM TO AL5.                                       DMN5773
      MOVE A5 (1) TO CA (10).                                          DMN5774
      MOVE A5 (2) TO CA (11).                                          DMN5775
      MOVE A5 (3) TO CA (12).                                          DMN5776
      MOVE A5 (4) TO CA (13).                                          DMN5777
      MOVE A5 (5) TO CA (14).                                          DMN5778
      COMPUTE NM5 = NR5 - 6 - CNPT4.                                   DMN5779
      MOVE NM5 TO AL5.                                                 DMN5780
      MOVE A5 (3) TO CA (23).                                          DMN5781
      MOVE A5 (4) TO CA (24).                                          DMN5782
      MOVE A5 (5) TO CA (25).                                          DMN5783
      PERFORM WIND-UP.                                                 DMN5784
      MOVE AVAILABLE-SNM TO DSN.                                       DMN5785
      MOVE '      NR(NK) = NR (NK + 000)$                       ' TO   DMN5786
           CARD-AREA.                                                  DMN5787
      MOVE CNPT4 TO AL5.                                               DMN5788
      MOVE A5 (3) TO CA (25).                                          DMN5789
      MOVE A5 (4) TO CA (26).                                          DMN5790
      MOVE A5 (5) TO CA (27).                                          DMN5791
      PERFORM WIND-UP.                                                 DMN5792
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    GO TO XALLA.                                          DMN5793
ALLX. EXIT.                                               DMN5794
    NOTE FINISH XXALL.                                    DMN5795
XXROT SECTION.                                            DMN5796
XXROTX. PERFORM STATE.                                    DMN5797
    MOVE 0 TO PAD.                                        DMN5798
XROT. MOVE 6 TO CNPT.                                     DMN5799
XROT1. ADD 1 TO CNPT.                                     DMN5800
    MOVE CN (CNPT) TO A.                                  DMN5801
    IF A = '$' GO TO XROTX.                               DMN5802
    IF A NOT = '(' GO TO XROT1.                           DMN5803
    MOVE 'NSAVE    ' TO REG9.                             DMN5804
XROT2. MOVE SPACES TO CARD-AREA.                          DMN5805
    MOVE 0 TO D5.                                         DMN5806
    MOVE 6 TO CAPT.                                       DMN5807
XROT3. ADD 1 TO D5.                                       DMN5808
    ADD 1 TO CAPT.                                        DMN5809
    MOVE R9 (D5) TO CA (CAPT).                            DMN5810
    IF D5 LESS THAN 9 GO TO XROT3.                        DMN5811
    MOVE '=' TO CA (17).                                  DMN5812
    PERFORM MET63.                                        DMN5813
    MOVE 0 TO D5.                                         DMN5814
    MOVE 18 TO CAPT.                                      DMN5815
XROT4. ADD 1 TO D5.                                       DMN5816
    ADD 1 TO CAPT.                                        DMN5817
    MOVE R9 (D5) TO CA (CAPT).                            DMN5818
    IF D5 LESS THAN 9 GO TO XROT4.                        DMN5819
    MOVE '$' TO CA (30).                                  DMN5820
    PERFORM WIND-UP.                                      DMN5821
    IF CN (CNPT) = ',' GO TO XROT2.                       DMN5822
    MOVE SPACES TO CARD-AREA.                             DMN5823
    MOVE 0 TO D5.                                         DMN5824
    MOVE 6 TO CAPT.                                       DMN5825
XROT5. ADD 1 TO D5.                                       DMN5826
    ADD 1 TO CAPT.                                        DMN5827
    MOVE R9 (D5) TO CA (CAPT).                            DMN5828
    IF D5 LESS THAN 9 GO TO XROT5.                        DMN5829
    MOVE '=' TO CA (17).                                  DMN5830
    MOVE 'NSAVE    ' TO REG9.                             DMN5831
    MOVE 0 TO D5.                                         DMN5832
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     MOVE 18 TO CAPT.                                                    DMN5833
 XROT6. ADD 1 TO D5.                                                     DMN5834
     ADD 1 TO CAPT.                                                      DMN5835
     MOVE R9 (D5) TO CA (CAPT).                                          DMN5836
     IF D5 LESS THAN 9 GO TO XROT6.                                      DMN5837
     MOVE '$' TO CA (30).                                                DMN5838
     PERFORM WIND-UP.                                                    DMN5839
     GO TO XROT1.                                                        DMN5840
 XROTX. EXIT.                                                            DMN5841
     NOTE FINISH XXROT.                                                  DMN5842
 XXRES SECTION.                                                          DMN5843
 XRES. PERFORM STATE.                                                    DMN5844
     MOVE 0 TO PAD.                                                      DMN5845
     PERFORM OPERAND.                                                    DMN5846
     MOVE '      DO 00000 NX = 1,000$                          ' TO      DMN5847
          CARD-AREA.                                                     DMN5848
     ADD 1 TO AVAILABLE-SNM.                                             DMN5849
     MOVE AVAILABLE-SNM TO AL5.                                          DMN5850
     MOVE A5 (1) TO CA (10).                                             DMN5851
     MOVE A5 (2) TO CA (11).                                             DMN5852
     MOVE A5 (3) TO CA (12).                                             DMN5853
     MOVE A5 (4) TO CA (13).                                             DMN5854
     MOVE A5 (5) TO CA (14).                                             DMN5855
     COMPUTE NM5 = NR5 - 6 - OP-COUNT.                                   DMN5856
     MOVE NM5 TO AL5.                                                    DMN5857
     MOVE A5 (3) TO CA (23).                                             DMN5858
     MOVE A5 (4) TO CA (24).                                             DMN5859
     MOVE A5 (5) TO CA (25).                                             DMN5860
     PERFORM WIND-UP.                                                    DMN5861
     MOVE '      NK=000-NX$                    ' TO CARD-AREA.           DMN5862
     COMPUTE NM5 = NM5 + 1.                                              DMN5863
     MOVE NM5 TO AL5.                                                    DMN5864
     MOVE A5 (3) TO CA (10).                                             DMN5865
     MOVE A5 (4) TO CA (11).                                             DMN5866
     MOVE A5 (5) TO CA (12).                                             DMN5867
     PERFORM WIND-UP.                                                    DMN5868
     MOVE '      NR(NK+000) = NR(NK)$                          ' TO      DMN5869
          CARD-AREA.                                                     DMN5870
     MOVE AVAILABLE-SNM TO DSN.                                          DMN5871
     MOVE OP-COUNT TO AL5.                                               DMN5872
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     MOVE A5 (3) TO CA (13).                                          DMN5873
     MOVE A5 (4) TO CA (14).                                          DMN5874
     MOVE A5 (5) TO CA (15).                                          DMN5875
     PERFORM WIND-UP.                                                 DMN5876
     MOVE 0 TO CNPT4.                                                 DMN5877
     MOVE 0 TO CNPT.                                                  DMN5878
XRES1. ADD 1 TO CNPT.                                                 DMN5879
     IF CN (CNPT) NOT = '(' GO TO XRES1.                              DMN5880
XRES2. PERFORM MET63.                                                 DMN5881
     MOVE '      NR(000) = 123456789$                          ' TO   DMN5882
          CARD-AREA.                                                  DMN5883
     ADD 1 TO CNPT4.                                                  DMN5884
     MOVE CNPT4 TO AL5.                                               DMN5885
     MOVE A5 (3) TO CA (10).                                          DMN5886
     MOVE A5 (4) TO CA (11).                                          DMN5887
     MOVE A5 (5) TO CA (12).                                          DMN5888
     MOVE 16 TO CAPT.                                                 DMN5889
     MOVE 0 TO D5.                                                    DMN5890
XRES3. ADD 1 TO D5.                                                   DMN5891
     ADD 1 TO CAPT.                                                   DMN5892
     MOVE R9 (D5) TO CA (CAPT).                                       DMN5893
     IF D5 LESS THAN 9 GO TO XRES3.                                   DMN5894
     PERFORM WIND-UP.                                                 DMN5895
     IF CN (CNPT) NOT = ')' GO TO XRES2.                              DMN5896
     NOTE FINISH XXRES.                                               DMN5897
STATE SECTION.                                                        DMN5898
ESTATE. MOVE CN (1) TO DS (1).                                        DMN5899
     MOVE CN (2) TO DS (2).                                           DMN5900
     MOVE CN (3) TO DS (3).                                           DMN5901
     MOVE CN (4) TO DS (4).                                           DMN5902
     MOVE CN (5) TO DS (5).                                           DMN5903
     NOTE FINISH STATE.                                               DMN5904
TRAN-NF2 SECTION.                                                     DMN5905
TF2. MOVE '2' TO DIDG.                                                DMN5906
     ALTER CY93A TO PROCEED TO CY91.                                  DMN5907
     PERFORM TRAM.                                                    DMN5908
     NOTE FINISH TRAN-NF2.                                            DMN5909
TRAN-NF1D SECTION.                                                    DMN5910
TF1. MOVE '1' TO DIDG.                                                DMN5911
     ALTER CY93A TO PROCEED TO CY93B.                                 DMN5912
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     PERFORM TRAM.                                                    DMN5913
     NOTE FINISH TRAN-NF1D.                                           DMN5914
TRAM SECTION.                                                         DMN5915
TN2. MOVE CARD-AREA TO TEMPORARY.                                     DMN5916
     MOVE 1 TO DELAY-D.                                               DMN5917
     MOVE 0 TO DELAY-D1.                                              DMN5918
     PERFORM TRANSLATE-CARD                                           DMN5919
     MOVE 0 TO CNPT.                                                  DMN5920
     MOVE 3 TO PTR.                                                   DMN5921
     MOVE DC1 (1) TO R3 (                                             DMN5922
     MOVE DC1 (2) TO R3 (2).                                          DMN5923
     MOVE DC1 (3) TO R3 (3).                                          DMN5924
CY91. ADD 1 TO CNPT.                                                  DMN5925
     MOVE R3 (1) TO DC (CNPT).                                        DMN5926
     MOVE R3 (2) TO R3 (1).                                           DMN5927
     MOVE R3 (3) TO R3 (2).                                           DMN5928
     ADD 1 TO PTR.                                                    DMN5929
     IF PTR = 81 GO TO CY92.                                          DMN5930
     MOVE DC1 (PTR) TO R3 (3).                                        DMN5931
     IF R3 (1) = 'N' AND R3 (2) = '2' GO TO CY93.                     DMN5932
     GO TO CY91.                                                      DMN5933
CY93. ADD 1 TO CNPT.                                                  DMN5934
     MOVE 'N' TO DC (CNPT).                                           DMN5935
     MOVE 'F' TO R3 (1).                                              DMN5936
     MOVE DIDG TO R3 (2).                                             DMN5937
CY93A. GO TO CY91.                                                    DMN5938
CY93B. ADD 1 TO CNPT.                                                 DMN5939
     MOVE R3 (1) TO DC (CNPT).                                        DMN5940
     MOVE R3 (2) TO R3 (1).                                           DMN5941
     MOVE 'D' TO R3 (2).                                              DMN5942
     CO TO CY91.                                                      DMN5943
CY92  MOVE 0 TO DELAY-D.                                              DMN5944
     PERFORM WRITE-OUT.                                               DMN5945
     NOTE FINISH TRAM.                                                DMN5946
MET63 S CTION.                                                        DMN5947
MET63A. MOVE SPACES TO REG9.                                          DMN5948
MET63B. ADD 1 TO CNPT.                                                DMN5949
     MOVE CN (CNPT) TO A.                                             DMN5950
     IF A = ',' GO TO MET64.                                          DMN5951
     IF A = ')' GO TO MET64.                                          DMN5952
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     IF A = '$' GO TO MET64.                                          DMN5953
     PERFORM R9LEFT.                                                  DMN5954
     MOVE A TO R9 (9).                                                DMN5955
     GO TO MET63B.                                                    DMN5956
MET64. PERFORM R9LEFT-JUSTIFY.                                        DMN5957
     NOTE FINISH MET63.                                               DMN5958
BRACKET-ERROR-1 SECTION.                                              DMN5959
BE1. MOVE SPACES TO OUT.                                              DMN5960
     MOVE 'C POSSIBLE EXCESS RIGHT BRACKET.                ' TO      DMN5961
          OUTCARD.                                                    DMN5962
     PERFORM WRITE-OUT.                                               DMN5963
     NOTE FINISH BRACKET-ERROR-1.                                     DMN5964
BRACKET-ERROR-2 SECTION.                                              DMN5965
BE2. MOVE SPACES TO OUT.                                              DMN5966
     MOVE 'C POSSIBLE EXCESS BRACKET.                      ' TO      DMN5967
          OUTCARD.                                                    DMN5968
     PERFORM WRITE-OUT.                                               DMN5969
     NOTE FINISH BRACKET-ERROR-2.                                     DMN5970
SCAN-CARD SECTION.                                                    DMN5971
SC. MOVE SPACES TO REG3.                                              DMN5972
     MOVE ZERO TO EQBC.                                               DMN5973
     MOVE ZERO TO BC.                                                 DMN5974
     MOVE ZERO TO EQ.                                                 DMN5975
     MOVE ZERO TO EQCM.                                               DMN5976
     MOVE 6 TO CNPT.                                                  DMN5977
C6. ADD 1 TO CNPT.                                                    DMN5978
     MOVE CN (CNPT) TO A.                                             DMN5979
     IF A IS EQUAL TO ' ' GO TO C6.                                   DMN5980
     IF A IS EQUAL TO '$' GO TO C7.                                   DMN5981
     IF R3 (1) IS NOT EQUAL TO ' ' GO TO C8.                          DMN5982
     MOVE R3 (2) TO R3 (1).                                           DMN5983
     MOVE R3 (3) TO R3 (2).                                           DMN5984
     MOVE A TO R3 (3).                                                DMN5985
C8. IF A IS EQUAL TO '(' ADD 1 TO BC.                                 DMN5986
     IF A IS NOT EQUAL TO ')' GO TO C9.                               DMN5987
     IF BC = 0 PERFORM BRACKET-ERROR-1.                               DMN5988
     SUBTRACT 1 FROM BC.                                              DMN5989
C9. IF A = '=' AND BC = 0 MOVE 1 TO EQ.                               DMN5990
     IF A = '=' AND BC NOT = 0 MOVE 1 TO EQBC.                        DMN5991
     IF A = ',' AND EQ = 1 AND BC = 0 MOVE 1 TO EQCM.                 DMN5992
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           GO TO C6.                                                    DMN5993
       C7. IF BC NOT = 0 PERFORM BRACKET-ERROR-2.                       DMN5994
           IF R3 (3) = ' ' GO TO C11.                                   DMN5995
       C10. IF R3 (1) NOT = ' ' GO TO C11.                              DMN5996
           MOVE R3 (2) TO R3 (1).                                       DMN5997
           MOVE R3 (3) TO R3 (2).                                       DMN5998
           MOVE SPACE TO R3 (3).                                        DMN5999
           GO TO C10.                                                   DMN6000
       C11. EXIT.                                                       DMN6001
           NOTE FINISH  SCAN-CARD.                                      DMN6002
       OPERAND SECTION.                                                 DMN6003
       OS. MOVE ZERO TO OP-COUNT.                                       DMN6004
           MOVE 6 TO CNPT.                                              DMN6005
       OS1. ADD 1 TO CNPT.                                              DMN6006
           MOVE CN (CNPT) TO A.                                         DMN6007
           IF A = '$' GO TO OSX.                                        DMN6008
           IF A NOT = '(' GO TO OS1.                                    DMN6009
           ADD 1 TO OP-COUNT.                                           DMN6010
       OS2. ADD 1 TO CNPT.                                              DMN6011
           MOVE CN (CNPT) TO A.                                         DMN6012
           IF A = ',' ADD 1 TO OP-COUNT.                                DMN6013
           IF A NOT = ')' GO TO OS2.                                    DMN6014
           GO TO OS1.                                                   DMN6015
       OSX. EXIT.                                                       DMN6016
           NOTE FINISH OPERAND.                                         DMN6017
$CBEND                                                                  DMN6018
$ENTRY                                                                  DMN6019
$IBSYS                                                                  DMN6020
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